

General Disclaimer

One or more of the Following Statements may affect this Document

- This document has been reproduced from the best copy furnished by the organizational source. It is being released in the interest of making available as much information as possible.
- This document may contain data, which exceeds the sheet parameters. It was furnished in this condition by the organizational source and is the best copy available.
- This document may contain tone-on-tone or color graphs, charts and/or pictures, which have been reproduced in black and white.
- This document is paginated as submitted by the original source.
- Portions of this document are not fully legible due to the historical nature of some of the material. However, it is the best reproduction available from the original submission.

**MIT-NASA WORKSHOP
AIRLINE SYSTEMS ANALYSIS
VOL. II**

MIT

(NASA-CR-135635) MIT-NASA WORKSHOP
AIRLINE SYSTEMS ANALYSIS, VOLUME 2
(Massachusetts Inst. of Tech.) 602 p HC
\$32.25 CSCL 05A

N73-32875
THRU
N73-32903
Unclas
G3/34 17392

**DEPARTMENT
OF
AERONAUTICS
&
ASTRONAUTICS**

**FLIGHT TRANSPORTATION
LABORATORY
Cambridge, Mass. 02139**

**July 1972
FTL Report R72-7**

PRECEDING PAGE BLANK NOT FILMED

Table of Contents (as compiled)

Volume I

Introductory Material

Dr. Taneja,	"Development of the Air Transport Industry"
Dr. Vittek,	"Role of the Federal Government in the Development of the U.S. Air Transportation System"
Prof. Simpson,	"An Analysis of Airline Costs"
Mr. Faulkner,	"The ATA-67 Formula for Direct Operating Cost"
Prof. Simpson,	"Technology for Design of Transport Aircraft"

Economics

Prof. Tideman,	"Basic Economic Principles"
Prof. Kneafsey,	"Basic Transportation Economics"
Prof. Miller,	"Determination of Fares: Pricing Theory"
Mr. Gebhardt,	"Differential Pricing Policy"
Mr. Hubbard,	"Economic Effect of Competition in the Air Transportation Industry"

Finance

Dr. Vittek,	"Basic Finance"
Mr. James,	"Capital Requirements for the Air Transport Industry"
Mr. Lloyd-Jones,	"Airline Finance"
Mr. Kuge,	"Role of the Export-Import Bank in Developing the Export Potential of Aircraft Sales"

Forecast and Demand

Dr. Taneja,	"Market Demand for Air Transportation"
Dr. Taneja,	"Techniques for Forecasting Air Passenger Traffic"
Mr. McMahon,	"Aviation Forecasting in ICAO"
Mr. Ransone,	"American Airlines' Propellor STOL Transport Economic Risk Analysis"

Forecast and Demand (con't)

Mr. Michelson,	"Transportation Systems Evaluation Model"
Mr. Sarames,	"World Air Travel Demand, 1950-1980"

Marketing

Mr. Raduchel,	"Determinants of Market Structure and the Airline Industry"
Prof. Kneafsey,	"Objectives of the Airline Firm: Theory"
Prof. Douglas,	"Problems of Excess Capacity"
Mr. MacKenzie,	"Role of the Manufacturer in Air Transportation Planning"
Mr. Roy,	"Consumer Marketing and the Airline Industry"
Mr. Colussy,	"Future Direction in Airline Marketing"

Volume II

Airports

Prof. de Neufville,	"Concentration of Airline Operations at Individual Airports"
Prof. Wiley,	"Planning, Management, and Economics of Airport Operation"
Mr. Buchbinder,	"Airport Economics: Management Control Financial Reporting Systems"
Mr. Augustinus,	"Port of New York Authority Market Survey Model"
Mr. Rogers,	"Route Award Considerations"

Cargo

Mr. Kersey,	"Economics of Air Cargo"
Mr. Kersey,	"Air Cargo Market Development"
Mr. Stout,	"Current Problems and Issues in the Development of Air Cargo"
Mr. Schneider,	"Future of the U.S. Domestic Air Freight Industry"

Third Level Carriers

Mr. Swan,	"Trends in Commuter Air Carrier Operations"
Mr. Lazarus,	"Service to Small Communities"
Mr. Coutts,	"Short-Haul Air Markets"
Mr. Eads,	"Third Level Air Carrier Service"

Rate Regulation

Dr. Vittek,	"Right to Regulate"
Dr. Vittek,	"Basic Rate Making Procedures"
Prof. Miller,	"Critique of CAB Economic Regulatory Policy"
Prof. Jordan,	"Survival, Profits, and Resource Utilization"
Mr. Baker,	"Regulating Trends and Emerging Profile of Air Transportation"
Prof. Cherington,	"Future of Regulation in the Airline Industry"

Merger Policy

Mr. Andrews,	"Mergers and Anti-Trust Issues in Recent CAB Cases"
Mr. Gillick,	"Department of Transportation Merger Policy"
Mr. Farmer,	"Justice Department Airline Merger Policy"
Mr. Colodny,	"Mergers -- The Airline Viewpoint"

International Policy

Mr. Butler,	"International Air Transportation Policy"
Mr. Snodgrass,	"Commercial Aircraft Development and the Export Market"
Mr. Brenner,	"Schedule Development and Route Planning"
Mr. Binder,	"International Air Transport and Federal Policy"
Mssrs. Phillips and Landry,	"Discussion of the U.S. International Air Transport Policy Statement of 1970"

Concentration of Airline Operations at
Individual Airports

W. Gelerman and R. de Neufville

It is shown that it is a natural property of air transportation networks for competitive airlines to concentrate their operations at individual airports serving a given market. This implies that a strategy of developing satellite airports is doomed to failure unless the competitive behavior of the airlines is restricted. The results are demonstrated by tracing out the implications of observed patterns of traveller behavior as regards choice of carrier on the optimal game strategy for any particular airline. Analytic results for a two airline--two airport situation are extrapolated to the more general case, and specific supportive evidence from current operations are cited.

TABLE OF CONTENTS

1. Objectives
 2. Initial Observations
 3. Traveller Response to Airline Service
 4. Implications of Traveller Response for Airline Strategy in a Given Market
 5. The General Problem
 - 5.1 Initial Assumptions and Definitions
 - 5.2 Two Airport Two Airline Example
 - 5.3 General Solution of the Two Airport Two Airline Problem
 - 5.4 Extrapolations
 6. Conclusions
 - 6.1 Statement of Conclusions
 - 6.2 Supportive Evidence
- References
- Appendix I Proof of Structural Properties of Renard's Model

1. Objectives

The purpose of this study is to define the patterns of behavior of airlines and air travellers in an air transportation network and to analyze the implications of such behavior with specific reference to their use of satellite airports.

2. Initial Observations

Initially it was necessary to get an overview of the relationships between small and large airports that serve a single metropolitan area. We wanted to know what the general tendencies were with respect to passenger volumes and scheduled flight frequencies. The following six airport "sets" were chosen for examination:

Cleveland - Akron

Detroit - Flint - Lansing - Toledo

Houston - Beaumont

Philadelphia - Harrisburg - Allentown

Pittsburg - Youngstown

San Francisco - Oakland - San Jose

We gathered our data on frequency of service from the CAB's "Airport Activity Statistics" for 1970 and from the "Official Airline Guide" (the former source deals with total frequencies at each port and the latter with the frequencies on specific links of the air transport network). (1,2) Data on demand were extracted from the CAB's "Origin-Destination Survey". We then used 1970

census data by county and by township to calculate the population within a radius of about fifty miles of each airport. The geographical proximity of each town to each airport determined to which airport its population was assigned.

The review of these data indicated, first of all, that the role of satellite airports at present is quite small. Secondly, it suggested that the market share of traffic of the satellite airports was low due to a lack of frequency of service. First, the demand per unit population (i.e. population nearest each airport, as described above) is much lower for the satellite airports than it is for the larger airports. (Figure 1) This implies at the very least that the large difference in airport use is not due only to the difference in population near each airport, but also to other factors as well. If population alone were a factor, the ratios of population to demand would be approximately the same at each airport. But, as Figure 1 shows, the difference in ratios between small and large airports is quite large. For example, the ratio of volume to population at Cleveland is slightly less than 1.0, while the value for Akron is in the vicinity of 0.12; similarly, Detroit has a value of about 0.8, whereas Lansing is at about 0.14 and Flint, about 0.07. These differences imply that the proximity of populations to airports contributes little in explaining the distribution of demand between neighboring airports. In any case it is clear that

connections and the availability of alternative flights as a protection against missed flights. (5,6)

In particular, Taneja concludes that:

"...the dominant explanatory variable of market share is frequency share. To the first approximation the relationship between the percentage market share and percentage frequency share is almost a straight line. However, by introducing a third variable, number of competitors in the market, we obtain a family of S-shaped curves."

Frequency share refers here to the percentage of non-stop and one-stop flights that are performed by a given airline in a given market (e.g. Boston to New York); similarly the market share refers to the percentage of passengers carried by a given airline in a given market.

Renard's further work on this subject also found an S-shaped relationship between market share, MS, and frequency share, FS. He puts forth the following interactive model to relate MS and FS for any airline, i:

$$MS_i = \frac{FS_i^\alpha}{\sum_1 FS_i^\alpha} \quad (3.1)$$

where α may depend on the number of competitors but appears to lie in the range $1 < \alpha < 2$. (Figure 4)

Renard's model has the following characteristics for which proofs are given in Appendix 2.

- (1) For any given frequency share an airline may have, its market share increases as the number of its competitors

increases and thus, as its relative size increases.

(2) If all $(M - 1)$ competitors of any airline i have equal frequencies, and if its frequency share is less than its equal share, $FS_i < 1/M$, its market share will be less than its frequency share, $MS_i < FS_i$. Conversely, if $FS_i > 1/M$, $MS_i > FS_i$.

The S-shaped function relating market share to frequency share would reflect what the airline industry tends to regard as a well-known tendency for the public to "go with the winner", that is, to travel disproportionately with the carrier that offers the most service along a particular route.

Evidence for the existence of this "S-shaped" response of the public is given by many instances. American Airlines, for example, has made a practice of scheduling at least one more flight than its competitors along given routes. As a result, American seems to have enjoyed a market share considerably larger than its frequency share, in particular along its coast-to-coast routes in competition with United and Trans World Airlines(6).

4. Implications of Traveller Response for Airline Strategy in a Given Market

The implications of the public's S-shaped response patterns to frequency of air service on the behavior of two competitive airlines is quickly and intuitively deduced. Assuming that costs of operating in a given market are directly proportional to

5

the number of flights, which is reasonable in general, there are ranges of operation for which revenues increase much faster than costs (i.e., above a 50% frequency share). Conversely, going below a 50% frequency share, revenues decrease much faster than costs. (Figure 5) Either airline will, naturally, try to increase its frequency share above 50%, as that maximizes profit. But the other airline, which would be forced into a profit-minimization point if it allows this to happen, will insist on maintaining its frequency share. Alternatively, it might choose to drop out of the market, but in any case would not, unless special circumstances prevail, choose voluntarily to accept less than its equal share (in this case, half) of the frequency and market share. In short, the non-linear response patterns of the travellers, when coupled with a linear cost function, places the competitive airlines in a dynamic game which forces them to one of three equilibrium points, as shown in Figure 5.

Exceptions to this rule are bound to exist. Some airlines, first of all, will not perceive linear costs as suggested by Figure 5, for a variety of scheduling and other reasons, their costs for providing a particular flight along a link may be very low. They may choose to offer the service because, even though it obtains a disproportionately small share of the traffic, its peculiarly low costs still make it profitable. Conversely,

some flights which may be offered operate at inconvenient times and do not, therefore, really compete. An airline may, then, justifiably accept a frequency share less than its equal share because it recognizes that its market share will not be significantly affected.

The significance of the kind of analysis suggested in the first paragraph does not lie in its possible precision, but in that it defines the dynamics of the competitive process in which the airlines are engaged, and prescribes the equilibrium points toward which they will tend. This kind of analysis will be extended to the general case of competition among several airlines and several airports, and is shown to provide a strong explanation for the inability of satellite airports to attract much traffic.

Considerable evidence exists to indicate that airlines actually compete as our analysis suggests. Taneja's data on two-airline competition shows that some 20% of all competitors in the sample have identical frequency shares, and about 50% have essentially identical frequency shares, namely between 44% and 56%. (Figure 6)(5)

The same kind of results are obtained when there are several competitors in a market. Analysis of the 1969 daily frequencies of the three major airlines in TWA's 25 top city-pair markets shows that, with the exception of three or four markets, each competitor has approximately the same number of flights (Table 1). (7)

A concrete example of the bad effects of not matching a competitor's schedule is provided by the experience of TWA on the Philadelphia-Los Angeles route in the summer of 1969. Prior to then, TWA and its competitors, American and United, each had two daily flights. That summer, American and United each laid on an extra flight. But TWA, arguing internally that, since the load factor on the route was only 50%, there were enough seats and no increase in capacity was warranted, did not add a flight. The result was that, as TWA's frequency share dropped from 33% to 25% or by a quarter, its market share was estimated to drop by nearly a third. (7)

The airlines themselves are well aware of this effect. To quote from the TWA report (Ref. 7):

"...No airline can be a fully effective competitor on a route if its schedules fail to provide time-of-day coverage at least approximately as convenient as the other carriers on that route." (p. 4)

"In a two-carrier competitive market, the incremental unit of capacity tends to be one schedule by each carrier, or two schedules for the industry.

"And the incremental unit of capacity in a three carrier competitive market tends to be three industry schedules." (p. 12)

"When one gets to larger markets, it becomes less vital to match another carrier's frequency precisely." (p. 5)

This last quote is of special interest. First it helps explain why "precisely equal" competitors many times do not exist. But more interestingly, it reflects the fact that relative frequency shares,

not relative absolute frequencies, are seen to be the important determinants of market share.

To illustrate how Renard's model explains the observed phenomenon that precise matching of competitive carriers' flights is most important in smaller markets, it is sufficient to trace through the effect of any competitor cutting out a flight in a market served, say, by four flights a day and by 10 flights. The loss in potential traffic is much greater in the smaller market.

Renard's S-shaped model appears to provide a reasonable basis for explaining the observed tendency of airlines to match schedules, and it also seems to explain adequately why, in large markets, it is "less vital to match another carrier's frequency precisely." In short, the S-shaped model of traveller response to frequency appears, by tracing out its implications through the competitive game, to provide a good explanation of why airlines schedule flights at airports as they do. A similar argument will now be used to explain how carriers schedule flights between principal and satellite airports.

5. The General Problem

5.1 Initial Assumptions and Definitions

The discussion of initial observations suggested that the relative frequency of flights in a given market was far more important than the distribution of population in explaining the distribution of demand between neighboring airports. Since the "frequency delays" caused by usual schedules are generally much larger than those due to airport access or airfield congestion, we may surmise that the latter factors are also less important in describing airport use.

If our observations to this point have any merit then we can see a parallel between the competitive situation of airlines and the competitive situation for airports. We may think of the airports as competing for a share of the existing market (to a given destination) on the basis of their relative frequency of service to the given destination. There is, of course, a conceptual difference between market share for airlines and market share for airports. With respect to airlines, the "market" refers to anyone who uses the airport as an origin for a specific destination; that is, the market is concentrated at one place. But with respect to airports, the "market" is dispersed and what may be defined as a "market" for one airport may not qualify as a "market" for another. But to the extent that the distribution of population is of minor significance, we feel justified in thinking

of the air passenger in a given area as constituting one market for any given destination (even though the other variables may help to explain market shares for airports, the frequency shares seem to be the primary descriptive variables and ought to give us the basic structure of the airport market share model).

To verify the plausibility of the parallel between passenger behavior for airlines and airports, the market share of airports was plotted versus their frequency shares. (Figure 7) Data for eight airport "sets" flying non and one-stop flights were used for this graph. Inspection of these points shows that there is a strong similarity to the s-shaped relationship postulated by Taneja and Renard for airlines.

The series of choices that must be made by each air passenger is illustrated by figure 8.

The passenger must first choose between airports, say I and II, and then choose from among the airlines, say a and b, within the chosen airport. Whereas before we explored what inference the non-linear passenger response to frequency had on airline behavior at a single airport, we are now interested in finding what each airline will do to maximize its share of the total market over two airports, and in determining what kind of stable equilibrium use of the airports may result. (In reference to our diagram, airline 'a' would try to maximize the sum of flows through paths 0-1-2-4 and 0-1-3-6).

Let us now define the symbols to be used in our analysis:

MS_j = market share of airport j

MS_i = total market share for airline i

MS_{ij} = that portion of MS_i which airline i accumulates in airport j

FS_j = frequency share of airport j

FS_{ij} = frequency share of airline i within airport j

Our problem is to find how each airline i can maximize MS_i , where, using the S-Shaped functions for passenger response:

$$MS_j = \frac{FS_j^\alpha}{\sum_j FS_j^\alpha}$$

$$MS_{ij} = MS_j \left[\frac{FS_{ij}^\alpha}{\sum_i FS_{ij}^\alpha} \right] = \left[\frac{FS_j^\alpha}{\sum_j FS_j^\alpha} \right] \left[\frac{FS_{ij}^\alpha}{\sum_i FS_{ij}^\alpha} \right]$$

$$MS_i = \sum_j MS_{ij} = \left[\frac{1}{\sum_j FS_j^\alpha} \right] \sum_j \left[\frac{(FS_j FS_{ij})^\alpha}{\sum_i FS_{ij}^\alpha} \right]$$

As each airline i tries to maximize its own market share, it will be opposed by other airlines which also want to maximize their market share. The problem then is to find an equilibrium state (if it exists) in which each competitor is satisfied that he cannot improve his position under existing conditions.

5.2 Two Airport - Two Airline Examples

To obtain insight into the nature of the problem we first explored a simple two airport - two airline situation. This example was examined by evaluating all relevant cases and seeing what happened. Subsequently, as indicated in sections 5.3 and 5.4, the general cases were examined.

As can be appreciated, the airlines are engaged in a competitive game. They assign their flights to either of two locations, and their assignments can be countered by their competitors. Their mutual object is to attain a position of maximum advantage, which reasonably appears to be defined, for fixed fares, as the largest market share. For a two competitor situation, the preferred strategy, the "solution", can be inferred from a payoff matrix.

We can use the formula for MS_1 to calculate a two dimensional payoff matrix for the two airport - two airline competitive situation. Assume that airline #1 has n_1 flights which it wants to allocate between the two airports and that airline #2 has n_2 flights that it wants to allocate. We define:

k = number of flights airline 1 allocates to airport 1

l = number of flights that airline 2 allocates to airport 1

$MS_1^{k,l}$ = the total market share for airline 1 when airline 1 allocates k flights and airline 2 allocates l flights to airport 1.

We can therefore get the following type of payoff matrix:

	0	1	2	...	l	...	m ₂
0							
1							
2							
...							
K							
...							
m ₁							

$MS_1^{k,l}$

$$MS_1^{k,l} = \left[\frac{1}{\left(\frac{k+l}{m_1+m_2}\right)^\alpha + \left(\frac{m_1+m_2-k-l}{m_1+m_2}\right)^\alpha} \right] \left[\frac{\left(\frac{k}{m_1+m_2}\right)^\alpha}{\left(\frac{k}{k+l}\right)^\alpha + \left(\frac{l}{k+l}\right)^\alpha} + \frac{\left(\frac{m_1-k}{m_1+m_2}\right)^\alpha}{\left(\frac{m_1-k}{m_1+m_2-k-l}\right)^\alpha + \left(\frac{m_2-l}{m_1+m_2-k-l}\right)^\alpha} \right]$$

While the values $MS_1^{k,l}$ represent the market shares for airline 1, the values $(1-MS_1^{k,l})$ would represent the market shares for airline 2. Analysis of this type of matrix for specific values of n_1 and n_2 amounts to a zero sum, two-player game. The payoff matrix for a two-airport two situation airline was calculated for $n_1 = n_2 = 10$ (Table 2). As can be seen, the first and last rows dominate all other rows for airline 1, while the first and last columns are dominated by all other columns for airline 1 (they therefore dominate all other columns when we speak in terms of payoffs for airline 2).

Analysis of this matrix using zero-sum, two player game theory indicates that five possible equilibrium states exist. The points are:

1. Each airline has all its flights at airport 2 ($k=0$ and $l=0$)
2. Each has all its flights at airport 1 ($k=n_1$ and $l=n_2$)
3. Airlines 1 and 2 each split their flights evenly between the two airports such that $k = (n_1/2)$, $l = (n_2/2)$
4. Airline 1 has all flights at airport 1 and airline 2 has all flights at airport 2 ($k=n_1$, $l=0$)
5. Airline 1 has all flights at airport 2 and airline 2 has all flights at airport 1 ($k=0$, $l=n_2$)

Naturally, these equilibrium situations presume that the markets around each airport are comparable. As, in reality, this will not be the case, some airport will have some intrinsic advantage, probably locational, so that some of the equilibria points will not be chosen. Specifically, airlines will not choose to locate at the less favorable airport if alternatives are available. As one is, namely that they both locate all their flights at a single airport, they will tend to do so - to the extent the analysis is correct. This is what is demonstrated below.

It can be shown that any two-dimensional payoff matrix of the type described here will have all of its four "corner values" and the central point, $MS_1^{(n_1/2, n_2/2)}$, equal. Since we are dealing with a fixed total demand, it is obvious that $MS_1^{0,0} = MS_1^{n_1, n_2}$ and that $MS_1^{0, n_2} = MS_1^{n_1, 0} = MS_1^{(n_1/2, n_2/2)}$ (airport location is assumed to be insignificant and the passenger is reacting to the flights). We must now show that $MS_1^{0, n_2} = MS_1^{0,0}$, from our equation for $MS_1^{k,l}$:

$$\begin{aligned}
 MS_1^{0, n_2} &= \left[\frac{1}{\left(\frac{n_2}{n_1+n_2}\right)^\alpha + \left(\frac{n_1}{n_1+n_2}\right)^\alpha} \right] \left[0 + \frac{\left(\frac{n_1}{n_1+n_2}\right)^\alpha}{\left(\frac{n_1}{n_1+0}\right)^\alpha + 0} \right] \\
 &= \frac{1}{\left(\frac{n_2}{n_1}\right)^\alpha + 1} \\
 MS_1^{0,0} &= \left[\frac{1}{0+1} \right] \left[0 + \frac{\left(\frac{n_1}{n_1+n_2}\right)^\alpha}{\left(\frac{n_1}{n_1+n_2}\right)^\alpha + \left(\frac{n_2}{n_1+n_2}\right)^\alpha} \right] \\
 &= \frac{1}{\left(\frac{n_2}{n_1}\right)^\alpha + 1}
 \end{aligned}$$

If we can show the dominance of end rows and end columns for all two airline two airport payoff matrices, we will be assured that equilibrium states always exist for such cases, and that they exist at $K = 0$ or n_1 and $l = 0$ or n_2 , as well as for their equivalent $K = n_1/2$, and $l = n_2/2$.

5.3 General Solution of the Two Airport Two Airline Problem

To show dominance for the end rows and columns as described in section 5.2, we need to show that the expression for $MS_1^{k,l}$ is a maximum either at $K=0$ or $K=n_1$ for any value of l , $0 \leq l \leq n_2$ (because it is arbitrary which airline we call 1 and which we call 2). Letting $N = n_1 + n_2$ and multiplying the numerator and denominator by N^α we get:

$$MS_1^{k,l} = \left[\frac{1}{(K+l)^\alpha + (N-K-l)^\alpha} \right] \left[\frac{K^\alpha}{\left(\frac{K}{K+l}\right)^\alpha + \left(\frac{l}{K+l}\right)^\alpha} + \frac{(m_1-K)^\alpha}{\left(\frac{m_1-K}{N-K-l}\right)^\alpha + \left(\frac{n_2-l}{N-K-l}\right)^\alpha} \right] = A+B$$

where:

$$A = \frac{K^\alpha}{K^\alpha + l^\alpha + (N-K-l)^\alpha \left[\left(\frac{K}{K+l}\right)^\alpha + \left(\frac{l}{K+l}\right)^\alpha \right]}$$

$$B = \frac{(m_1-K)^\alpha}{(m_1+K)^\alpha + (m_2-l)^\alpha + (K+l)^\alpha \left[\left(\frac{m_1-K}{N-K-l}\right)^\alpha + \left(\frac{n_2-l}{N-K-l}\right)^\alpha \right]}$$

Dividing A through by K^α and rearranging we get:

$$A = \frac{1}{\left[1 + \left(\frac{l}{K}\right)^\alpha \right] \left[1 + \left(\frac{N}{K+l} - 1\right)^\alpha \right]}$$

Therefore, $A = 0$ at $K = 0$ and A increases monotonically as K increases.

If we divide B through by $(n_1 - K)^\alpha$ and rearrange, we get :

$$B = \frac{1}{\left[1 + \left(\frac{n_2 - l}{n_1 - K}\right)^\alpha\right] \left[1 + \left(\frac{1}{\frac{A}{K+2} - 1}\right)^\alpha\right]}$$

So that $B = 0$ at $K = n_1$ and B decreases monotonically as K increases.

We now know that $MS_1^{k,1}$ is correctly represented by either of two graphs as K is advanced from 0 to n_1 . (Figure 9) We have also shown for one particular case (Table 2) that $MS_1^{k,1}$ is maximum at $K = 0$ and $K = n_1$, thus it is impossible for graph II to be true.

We have therefore shown that the "all or nothing" allocations of flights, the corner points, are always optimal for the two airport two airline situation. By extension so is their equivalent, the center point.

5.4 Extrapolations

From what we know of the two airline case and from what we have shown about the structure of Renard's market share model, we can project some results for the three or four airline situation. We have shown for the two airline - two airport case that an equilibrium state could exist for any "all or nothing" combination of allocations by the two airlines (i.e. for any combination of $K = 0$ or n_1 and $1 = 0$ or n_2). Then theoretically an equilibrium situation could exist if both airlines were to choose the same airport or if each were to choose a different airport.

Let us now suppose that we start with an equilibrium state in which one airline has all its flights out of one airport and the other airline has all its flights out of the other airport (in a two airline two airport situation), and then a third airline enters the scene; assume that each of the three airlines has n flights available to it. If airline #3 were to split its flights equally among the two airports, its MS would be, since each airport would have half of the total:

$$MS_3 = \left[\frac{\left(\frac{m}{2}\right)^\alpha}{\left(\frac{m}{2}\right)^\alpha + m^\alpha} \right] \left[\frac{1}{2} \right] + \left[\frac{\left(\frac{m}{2}\right)^\alpha}{\left(\frac{m}{2}\right)^\alpha + m^\alpha} \right] \left[\frac{1}{2} \right]$$

$$= \left[\frac{\left(\frac{m}{2}\right)^\alpha}{\left(\frac{m}{2}\right)^\alpha + m^\alpha} \right] = \frac{1}{1 + 2^\alpha} < \frac{1}{3} \text{ for } \alpha > 1$$

If it were to decide to put all its flights at one airport, its MS would be:

$$MS'_3 = \left[\frac{m^\alpha}{m^\alpha + m^\alpha} \right] \left[\frac{(m+m)^\alpha}{(m+m)^\alpha + m^\alpha} \right] = \left[\frac{1}{2} \right] \left[\frac{1}{1 + \left(\frac{1}{2}\right)^\alpha} \right]$$

$$= \frac{1}{2^{1-\alpha} + 2} > \frac{1}{3} \text{ for } \alpha > 1$$

It would therefore be wise for the third airline to put all its flights at one airport rather than to split its flights equally. While we do not know whether or not some strategy which lies between an even split and a 0% - 100% split is better than a 0% - 100% split, it appears highly unlikely. Each time the airline removes

one flight from the airport going to 0% and adds it to the airport going to 100% it is decreasing its share in the airport whose market share is less than its frequency share while at the same time increasing its share in the airport whose market share is greater than its frequency share. If we assume then that airline 3 puts all its flights at the airport with airline 2, are we at an equilibrium situation? The answer is obviously "no!" If airline 1 were to stay where it is it would have all of the market share of airport 1, where the market share is less than one-third. This is obviously because only two airports are in competition and, according to the structure of our model, airport 1 would have $MS < FS$, where $FS = \frac{1}{3} \leq \frac{1}{m}$ for $m=2$).

But if it moved all its flights to airport 2, it would have a proportional share, or $1/3$, of the entire market, a better situation. So the intrinsics of a third carrier will impell the others to concentrate their flights at a single airport.

If we had originally assumed that the first two airlines were both entirely at a single airport, the third airline to arrive would have found itself in the same position that airline 1 found itself after airline 3 had arrived. Thus for the three airline competitive situation there exists only one equilibrium situation, or two equilibrium points where the carriers are all located either at one airport or the other (where all flights are at a single airport), whereas the two airline case may have (under ideal conditions where

the distribution of population is not a factor) five equilibrium points.

Now let us extend this reasoning to a four airline competitive situation. The fourth airline enters a market in which three airlines are concentrated at one airport; it can either place all its flights at the same airport as the others or it can put some number of flights at the airport which presently has no service. It seems intuitively obvious that no matter how many flights the fourth airline wishes to place in this market, it would be best to put them all at the busiest airport. If it put all its flights at the other airport, it would be in a two competitor situation where its frequency share would be equal to:

$$\frac{m_4}{m_1 + m_2 + m_3 + m_4}$$

If, on the other hand, it put all its flights at the other airport, it would be in a four competitor situation with the same frequency share, which (according to the structural property proved earlier) would result in a higher market share than the two competitor situation.

6. Conclusions

6.1 Statement of conclusions

We have suggested, through a series of logical arguments, that it is better in a two airport situation for a number of airlines serving a given market to congregate at a single airport rather than to split into two groups of airlines, each group using a different airport to serve the same market. We have also shown through intuitive

reasoning that the congregation of all airlines at a single airport is the absolute optimum situation; that is, that the splitting of flights between airports (in serving a particular market) by any one airline is a sub-optimal strategy and therefore an unstable situation. We have not yet been able to present any rigorous mathematical proof of the latter assertion. It would, therefore, appear that the concentration of traffic for any market at a single airport in a given metropolitan area is the natural result of the competitive game played by the airlines. Satellite airports can therefore never be competitive with existing airports unless measures are taken to limit the degree of competition at the existing airports.

6.2 Supportive Evidence

Evidence in support of these conclusions can be found in all multi-airport regions of our country. The following examples are extracted from Batchelders' thesis (8).

- 1) In competition with O'Hare Airport in the Chicago area, Midway Airport has seen very little use despite pressure by the airport authority and despite congestion delays at O'Hare.
- 2) In spite of the numerous airports located within the Los Angeles region and the San Francisco region, there is only one important link between the two regions, that between the major airports, San Francisco and Los Angeles International.

3) In the Washington region, almost all short haul traffic goes through National, while most long haul traffic goes through Dulles. The traffic at Dulles is more or less forced there by long haul restrictions at National, whereas the concentration of short haul traffic at National is voluntary and no doubt the result of competition among the airlines.

4) In New York we find that most long haul markets are served at Kennedy, while most short haul markets are served at La Guardia and Newark. But even for the short haul markets, either Newark or La Guardia dominates any given market.

That the previous examples are the result of the competitive games played by the airlines is supported further by the following statement made by TWA (7):

"Normally, the provision of service at a satellite is not obtained by mere transfer of a carrier's flights previously serving the area's primary airport. The reason gets back to the competitive considerations set forth at the outset... even though a carrier starts supplemental service at a satellite airport, it is not prepared to seriously impair the competitive attractiveness of its pattern at the primary airport."

The airlines know that to remove flights from a given market in the primary airport and to move these flights to the secondary airport would hurt them in terms of total market share. Their only alternative is to leave the frequency of service as it is at the primary airport and to bring in new flights at the satellite airport; but since for most markets the existing number of flights are more than enough to meet demand, it seldom pays for an airline to add even more capacity to that which is already available.

REFERENCES

1. Civil Aeronautics Board, "Airport Activity Statistics of Certificated Route Air Carriers", 1970.
2. "The Official Airline Guide, Quick Reference North America Edition," Reuben H. Donnelly Corporation, Chicago, December 1, 1971.
3. Civil Aeronautics Board, "Origin-Destination Survey of Airline Passenger Traffic," Second Quarter, 1970.
4. United States Bureau of the Census, "Number of Inhabitants", 1970 Census of Population
5. Taneja, N.K. "Airline Competition Analysis," unpublished report, MIT Flight Transportation Laboratory, No. FTL R68-2.
6. Renard, G. "Competition in Air Transportation, An Econometric Approach," MIT Department of Aeronautics and Astronautics, September, 1970.
7. Trans World Airlines, "Discussion of Airline Load Factors and Capacity", August, 1969.
8. Batchelder, J.H. "A Market Area Analysis of Parallel Air Service Between Two Regions," MIT Department of Civil Engineering, January 1972.

APPENDIX IProof of Structural Properties of Renard's Model

Proof (1)

Property:

For any given frequency share, as the number of competitors gets larger, the corresponding market share also gets larger.

Proof:

Let F_1 = frequency share of airline 1 in a given market

U_j, P_j are frequency shares of competitors of airline 1

We must show that:

$$MS_1 = \frac{F_1^\alpha}{F_1^\alpha + \sum_{j=2}^n U_j^\alpha} < MS'_1 = \frac{F_1^\alpha}{F_1^\alpha + \sum_{j=2}^{n+1} P_j^\alpha}$$

where:

$$\sum_{j=2}^n U_j = \sum_{j=2}^{n+1} P_j$$

for $n=2$ and $U_2 = P_2 + P_3$, we must show: $(P_2 + P_3)^\alpha > P_2^\alpha + P_3^\alpha$,

which is equivalent to showing that:

$$1 + (P_3/P_2)^\alpha < (1 + P_3/P_2)^\alpha$$

letting $P_3/P_2 = \mu$, $\mu > 0$, $\alpha > 1$

then we know that: $(1+\mu)^{\alpha-1} > \mu^{\alpha-1}$
 $\therefore (1+\mu)^{\alpha-1} [1+\mu] - \mu^{\alpha-1} [\mu] > [1+\mu] - \mu$
 $\therefore (1+\mu)^\alpha - \mu^\alpha > 1$
 $\therefore 1 + \mu^\alpha < (1+\mu)^\alpha$

The proof is now complete.

Proof (2)

Let: m = number of competitors in a given market at a given airport

n_k = number of flights by airline 'k' at the given airport
and for the given market

N = total number of flights for the given airport

$n_i/N = FS_i$ = frequency share of airline i

$1/r = MS_i$ = market share of airline i

Property:

If all $m-1$ competitors of airline 'i' have equal frequencies, then:

$MS_i < FS_i$ when $FS_i < 1/m$

and $MS_i > FS_i$ when $FS_i > 1/m$

Proof:

Substituting into Renard's formula we get:

$$\frac{\left(\frac{m_i}{N}\right)^\alpha}{\left(\frac{m_i}{N}\right)^\alpha + (m-1) \left[\left(\frac{N-m_i}{m-1}\right)/N\right]^\alpha} = \frac{1}{r}$$

$$\frac{1}{1 + (m-1) \left[\frac{N-m_i}{m_i(m-1)}\right]^\alpha} = \frac{1}{r}$$

$$(m-1)^{1-\alpha} \left[\frac{N}{m_i} - 1\right]^\alpha = r-1$$

$$\left(\frac{m-1}{r-1}\right)^{1-\alpha} \left[\frac{N}{m_i} - 1\right]^\alpha = (r-1)^\alpha$$

\therefore for $2 < \alpha < 1$ and $r > m$ (or $1/r < 1/m$)

$$\left(\frac{m-1}{r-1}\right)^{1-\alpha} > 1$$

$$\therefore N/m_i < r$$

which implies that

$$MS_i = \frac{1}{r} < m_i/N$$

i) Thus for $MS_i < \frac{1}{m}$, $MS_i < FS_i$

we must show that when $MS_i < \frac{1}{m}$, $FS_i < \frac{1}{m}$

$$\text{Let } FS_i = \frac{m_i}{N} \quad \text{and } FS_0 = \left[\frac{(N-m_i)}{(m-1)} / N \right]$$

$$\text{then } \frac{FS_i^\alpha}{FS_i^\alpha + (m-1)FS_0^\alpha} = \frac{1}{r}$$

$$\therefore (m-1) \left(\frac{FS_0}{FS_i} \right)^\alpha = r-1$$

Since $2 < \alpha < 1$ and $r > m$, we see that

$$\left(\frac{FS_0}{FS_i} \right)^\alpha > 1$$

$\therefore FS_0 > FS_i$, which says that each competitor's share must be larger than 'i's' share.

$$\therefore FS_i < \frac{1}{m}, \text{ for } MS_i = \frac{1}{r} < \frac{1}{m}$$

ii) Thus for $FS_i < \frac{1}{m}$, $MS_i < FS_i$

It can similarly be shown that for $FS_i > \frac{1}{m}$, $MS_i > FS_i$.

N73-32877

PLANNING, MANAGEMENT, AND
ECONOMICS OF AIRPORT OPERATION

by John Wiley
M. I. T.

July 14, 1972

Abstract

An overview of the role of the airport in the transportation complex and in the community; the establishment of the airport including its requirements in regional planning and the operation of the airport as a social and economic force.

I would like to ask you to think with me in a non-dimensional way about the airport as a part of the air transportation system under three broad headings:

First - the various roles the airport plays in the system.

Secondly - what goes into the establishment of the airport, especially in the planning area.

Finally - what considerations must be given primary weight in the operation of the airport.

As we reflect on these aspects of the airport as a part of the air transportation system I will also attempt to highlight certain problem areas that need attention.

THE ROLES AN AIRPORT PLAYS

1. Airside Part of Airport

Here aircraft land, take off, are serviced and are separated from or united with the loads they have carried or will carry.

This is the part of the airport historically associated with the term "airport manager". This is the technical and operational part of the airport and involves interfaces with suppliers and operators of new equipment; with the ATC function and with the provision of emergency rescue services. Problem: Airplanes can be produced faster than this type of facility. There is a need for more planning and construction lead time.

2. Land Side Part of Airport

Here passengers and cargo arrive and depart by various

ground means or local air transport. They enplane or deplane using such services or processing as may be appropriate or desired during the transition.

This is the part of the airport that has mushroomed in recent years into acres of car parks, complexes of terminal buildings and myriads of services demanded by or offered to patrons in today's living. Let us call it the commercial/social part of the airport. For the future we must look toward a simplification of these functions and a reduction of the ground handling costs associated with them. There will be more off airport processing, more mass transfer direct to plane side; more use of rail from city centers; and more use of busses and exclusive bus lanes from regional collection centers.

3. The Airport as a Community Asset

An airport stimulates the economy. It is a resource as an employment center and a generator of secondary employment and income, an educational center, a recreational area, and a source of improvement to the environment and ecology of the community and an influence in this direction with all parts of the aviation industry.

After listening to the environmental concern so eloquently expressed last year at the MIT/NASA V/STOL Workshop and again last November at NASA's Langley Conference on "Vehicle Technology for the 70's and Beyond" it would be redundant for me to urge again that the various quieting programs now underway

be expedited. We are beginning to pay a frightful price in stymied development for our neglect in the past. There is and will be no fourth airport in New York. There may be ultimate limitations on airline runways at Kennedy, La Guardia and Newark Airports. The Everglades jetport is stopped. In L.A. there are noise suits. Palmdale is stymied; Boston at an impasse. (In Boston, the Mayor classifies airports in the same league with dope pushing, prostitution and crime). We must begin to use transportation resources to at least help to improve the environment. I had hoped the PONYA could have demonstrated this by cleaning up Jamaica Bay as it produced the needed new runways at JFK, but the NASA study said the two could not be done compatibly. (At this juncture let me pay tribute to NASA and specifically to Ed Cortright for organizing the above referred to conference at Langley last November. Ed's keynote address at that conference with its succinct slide reproductions should be required reading for everyone in airport and aviation planning.)

4. Airport Dealings with Governments (local, country, state, federal and agencies thereof.) The problem is to devise means of making it possible for the elected official to say "yes" instead of necessarily currying favor with the electorate by opposing any and all new technological developments.

1

5. The Airport Role in Dealing with Area, Regionwide or National Planning Agencies.

Obviously the airport must be planned in collaboration with area regional and national planning agencies and they have to be brought in before the fact and not read about the proposed development in the papers. A disgruntled state highway director doesn't produce very good access to airports. But even more important is that the size and capability of the airport must bear some relationship to the region's needs. Conversely if airport development (and capacity) is stymied for environmental or other reasons, regional planners must know it to chop off other development that would otherwise get out of phase.

While on this subject of regional capacity let me digress for a moment to comment on one of Dave Cout's points - the size of the market for STOL services. I believe his conclusions were directed to the so-called natural demand market which in many cases did not appear sufficient to justify development of the new vehicle. I submit that there is another market - I will call it a market of necessity - which should be added to the natural demand market and which may therefore affect the conclusion. This market of necessity is produced by the upcoming shortage of CTOL runway capacity in many hubs

due to the arrest of development for environmental and political reasons. In the NY area, for example, the denial of a 4th airport site and the denial of additional runways for JFK in Jamaica Bay make it inevitable that at some time in the future the existing CTOL runways on JFK, LaGuardia and Newark will have to be restricted solely to that traffic which cannot move either by other modes or by aircraft which can use STOL runways on JFK and Newark or at other STOLports to be developed. You heard Bob Ransome refer to this probability yesterday when he said the limited gate capacity at LaGuardia should be used for medium/long haul jet services and not for PSA style services.

6. The Airport's Role Vis-a-Vis the Role of the Airline (national or other).

This question applies more generally outside the USA in jurisdictions where the national airline and the national airport are operated by the same entity and involves the degree of subsidization - if any - that should be accorded to each. By the back door this also raises the question of the equitability of the level of airport charges which we will pick up further along.

II. ESTABLISHING AN AIRPORT

2.1 General Criteria and Policy Objectives of the Planning Process.

In this area the governing factors will be the time period over which the airport system is expected to function, the

scope, meaning the size of the area to be served by the airport, the type of an airport that is contemplated, the standards to be followed, (whether national or international), and finally the type of ownership, operation and regulation of the airport under consideration.

2.2 Study Organization

Organization for the study must include identification of issues or specific issues to be studied; the limitation that may be imposed on the study by work schedules and available budgeted funds; and a detailed layout of the structure of the study and the procedures to be followed.

2.3 The Planning Process

There are certain steps which must be followed in the planning process consisting of: (a) an inventory of existing facilities; (b) forecasts of the traffic to be handled; (c) demand and capacity analyses of the several components of the airport system: namely, aircraft, airfield, terminal airspace and ground access technology; (d) facility requirements and (e) environmental studies. It is in the area of (c) above that the excellent work of Ed Cortright and NASA are making such an appreciated contribution.

2.4 Site Selection

This process includes the ranking of alternatives and the

selection of systems. It is most important that in the site selection process there be progressive utilization of the preliminary office study; primary and final field surveys and a great deal of attention paid to the establishment of relations with the community and other planning agencies at the right times in the process. The latter point is emphasized by what we did not do in New York when conducting the preliminary studies for the fourth airport. A premature leak in the press put the pack in full cry before we could even try to enlist the support we needed - the rest is history.

2.5 Evolution of the Master Plan.

This involves several different layouts; the airport; land use around the airport; the terminal area; and means of airport access. There must also be a financial analysis including schedules and costs, studies of economic feasibility and methods of financing.

2.6 Evaluation of the Master Plan

Here all of the skills and methodology of cost benefit and cost effective analysis must be brought into play to insure the selection of the most feasible master plan.

2.7 Plan Implementation.

When it comes to implementing the plan selected the considerations are many. The political and environmental climate

must be given full weight in establishing the timing, financing, and land acquisition schedule. Likewise, the recommended legislation or regulation for the airport and appropriate land use controls must be most carefully dealt with. Here again insoluble problems will arise unless careful coordination is exercised at the proper time with those who can say "No."

2.8 Organization, Staffing, and Direction

This is probably one of the most vital steps in the establishing of the airport. We must think of the organization chart as the skeleton of the human frame: the job descriptions which tell what people do are the flesh and blood. The working relationships which define how people react with one another are the nerve system of the enterprise.

The organizational structure and the people who man it must be flexible enough in their working relationships to permit the use of task forces drawing on many different disciplines to solve a particular problem when appropriate. There must be a definite plan made also for the training and on-the-job development for staff.

I cannot emphasize enough the importance of the staffing process, particularly the facet requiring a full mutual knowledge and understanding of working relationships between

the boss and those he supervises in both directions, and between those they serve, or advise or audit in both directions. This subject is several lectures in itself.

III. OPERATION OF THE AIRPORT

We heard Jim Miller say that one of the highest forms of managements is that it will be economically efficient. Perhaps this can be paraphrased to say that successful management is the walking of a tightrope between many conflicting standards. For example, a balance must be struck between economics on one hand, and environmental considerations on the other, and between the need to expedite the flow of traffic and the need for careful screening to prevent highjacking. Let's plunge right in to the operation of the airport by talking first about:

3.1 Capital Revenue and Expense Budgets for Control of Operating Results

This involves the formulation and use of continuous long-range moving capital forecasts; provision for the transition of these forecasts each year to the annual budget; codification of revenues and cost budgets by revenue centers, cost centers and management control centers; and reporting operating results thereon in the same code. This of course is the key to successful management. The airport must be fully cost accounted and must pay for or know what the costs are

for everything it does whether it is operating on a self-supporting or a subsidized, cost-known, basis.

3.2 Property Control:

This is a broad subject covering the acquisition of property, its inventory and disposal and procedures for revenue collection and deposit and fund control.

3.3 Project Coordination, Evaluation, and Control

This is one of the most important series of functions in every airport management. The key is the repetition of the economic analysis at each milestone to be certain variations from the financial plan are caught while there is still time to take corrective action. As I lay out the steps to be taken in Project Coordination, Evaluation and Control, I will show by an asterisk (*), each time the all important economic analysis must be made. The steps are: The forecasts; the functional plan; the planning, or stage one cost estimate*; coordination with users, leasees, operators, and other interested governments or agencies; the stage two estimate*; project approval; contract plans and specifications; preparation of the contract by the law department; advertising for bids; stage three estimate*; award of contracts; supervision of construction; (change orders and claims should be supported by stage three estimates* or by costs added by structural

integrity considerations supported by stage three estimates or actual quotations*); approval of payments to contractors or the withholding of payments until work is satisfactorily performed; certification of completion or occupancy; and finally post-completion analysis of the project immediately upon completion and periodically thereafter. The constant economic evaluations are required to control the project for the maintenance of adequate coverage of the investment and includes the necessity to either scale the project down, or revise revenue projections upward when coverages appear in jeopardy.

3.4 Safety Services and Requirements:

Here a uniformed code of airport rules and regulations must be developed, circulated, explained and enforced. Security forces must be trained in various disciplines and operate with all the elements of the airport organization as well as with the tenants of the airport under a well defined, publicized and understood emergency plan. The security forces must maintain a close liason with the law department of the enterprise to cover enforcement measures and must deal with such matters as fire prevention, theft prevention, traffic control, sabotage, highjacking prevention and the use and the development of appropriate emergency equipment.

3.5 Compliance with Federal or International Standards

This facet of airport operation requires the determination as to whether national or international standards will be followed in the operation of the airport and involve questions as that of airport certification by the national government currently under discussion in the United States.

3.6 Relations with Users, Suppliers, and Services:

The airport operator quite obviously must maintain day-to-day working relationships with such variegated tenants as airlines, the postal administration freight forwarders, truckers, customs brokers, customs, immigrations, and health authorities, concessionaires, fuel companies, utilities, ground transport operators, industrial tenants, aerospace industry tenants, agricultural developers interested in using the airport land, not to mention passengers and patrons using the airport. In these relations with all of the foregoing tenants in the airport the needs and opportunities for revenue development from each type airport user must be kept uppermost in mind. The latter point - revenue development opportunities from each type airport user gives rise to one of the largest sources of misunderstanding that exist today between airports and their users: namely what are the equities of airport charging? The answer lies not with the airport

operating entity but in most cases with the airport owner-- generally a municipality, county, state, or, outside the United States, a nation. The decision as to whether an airport shall be self-supporting, or subsidized, is one that is usually made directly or indirectly by the electorate of the owning entity. In the New York area the decision was made by the cities of New York and Newark in 1947 that they wanted their airports not only to be self-supporting but also to contribute a return on the investments that had been made in the airports. They wanted to use their capital for schools, hospitals, and other purposes and not for airports. An equally valid decision is frequently made by a country where the National airport might be regarded as a source of tourism or used to attract industry to a developing nation. As such, the national government of that country, could be perfectly rational in determining that its airport deserves subsidized support.

3.7 Airport Maintenance:

The first step is to develop a long range periodic maintenance plan, from which may be derived annual major work programs and routine planned maintenance programs, leaving an adequate amount of budgeted time to handle the inevitable unscheduled or non-routine maintenance, usually

called repairs. Too often the maintenance program of an airport degenerates into a galloping rush to keep ahead of the last category just mentioned, an unscheduled or non-routine maintenance or repairs. It is also a temptation in lean years to defer scheduled major work programs or routine planned maintenance - a temptation that must be rigorously resisted. In passing, let me say that computer techniques are now coming into successful use to inventory, schedule, record and report maintenance functions and thereby greatly facilitate management budgeting and man-power control.

3.8 Supervision of Construction:

This means the completion of the proposed construction within the budgeted time and cost. This process requires dealing extensively with contractors and suppliers in the conduct of the work. Behind the scenes there is a constant interchange with planners and designers in handling change orders, liason with air traffic control services and airport operations to hold to a minimum interference by construction activities with the operation of the airport, with engineers in matters of quality control and structural integrity, with financial interests to be certain that the work is progressing economically, with legal officers in the handling of the inevitable claims during a construction, with purchasing

to assure the on-time arrival of equipment and supplies and so on. This function is a vital part of the important project coordination and control process described previously. The breakdown just outlined, can only hint at the complexities involved yet the failure to properly execute this function exerts a tremendous impact on the airport, and more seriously on the aviation system viability.

3.9 Airside Operations

This is of course quite obvious and refers to the managing of the "airplane part" of the airport.

3.10 Landside Operations

This is equally obvious and deals with the managing of the "people and land transport" part of an airport, including the all-important subject of facilitation.

Both of the functions just mentioned cover the implementation of two of the principal roles the airport plays as we reviewed earlier.

3.11 Public Relations

This varies all the way from the establishment and enforcement of the standards of service at the airport to the performance of community service including liason with such community leaders in such difficult areas as noise control, and so forth. It includes promotional activities, the preparation

of speeches and publications, and the writing of reports. With the rise in environmental concern in recent years the public relations function, particularly in community service aspects, has assumed enormous proportions. Public relations can only function when it is backed up by unquestioned product performance. The successful introduction of the DC-10 and L-1011 into La Guardia during the last year is a case in point. The big problem and task facing public relations - and all of us for that matter - is to prevent wrong decisions from being made based on erroneous data whipped into a tidal wave of opposition by mostly innocent but sometimes erroneously inspired leaders. The rapid rise of opposition to a STOL-port in the New Jersey meadows is a good example. Another is the threatened political closure of a beautiful downtown airport at Rotterdam ideally situated and sized not only for V/STOL but also for DC-10 and L-1011 and Airbus operations. The reason? Present operations by BAC-11's and Caravelles are noisy and the officials in charge lack knowledge of what QTOL's and the DC-10 and L-1011 can do to alleviate the strong bias in the population against the airport. We did furnish the low noise footprint and pollution characteristics of these new aircraft to the leaders and may possibly have contributed to an avoidance of this closure.

These are some of the problems engendered and the processes that must be followed in planning, managing and operating airports today. As in everything else the resulting rise in complexity is immense and new solutions and new technology are in urgent demand.

173-32876

**Airport Economics:
Management Control Financial Reporting Systems
Allen Buchbinder**

As our three major airports and their related facilities grew, the Aviation Department of the Port Authority was faced with many new and varied problems in developing and maintaining a comprehensive system of reporting financial data and results to management.

Port Authority operation of the airports commenced in 1948 and during the intervening years to 1971, these airports experienced a 10 fold growth in passenger traffic to 38,000,000. Plane movements accelerated from approximately 1/4 million per year to approximately 850,000 per year, and Port Authority airport investment expenditures increased to such an extent that it now exceeds one billion dollars.

Concurrent with this growth, evolutionary technological changes took place in Electronic Data Processing and in its application to accounting and financial control.

Years ago, as we all remember, the hardware consisted of a reliable #2 pencil, long pads of paper, green eye shade, and a manually operated calculator that cranked into operation somewhat like a Model T Ford. A raft of work paper was produced by hand, typed in the proper format, and subsequently transmitted to management. It took a long time before these reports were received and, in many cases, corrective action would be too late to be effective.

In 1956 the Port Authority acquired an IBM 650 machine, and a transformation from a manual to electronic/manual preparation took place. Off came the green eye shades, and our accountants were able to provide instructional data to our electronic data specialists who programmed computer equipment to procure the same and better reports so that timeliness was improved and the accountants could devote themselves to analysis work. The gains were considerable but the reports were generally in summary fashion and did not really lend themselves to relaying detailed net operating results. Many calculations still had to be made due to limitations of the 650 and

the green eye shades were more often on than not.

In 1961, the 650 was replaced with an IBM #7070 which had greater capabilities, and net operating results were accomplished with the accountants furnishing instructions to the programmers for most all the essentials of the reporting procedure.

Keeping pace with the Data Processing technology, conversion to an IBM #1401 with tape processing capabilities used in conjunction with the 7070 was accomplished in 1963. Utilizing the 7070/1401 "hardware", Aviation Department operating and financial staff introduced a change in both the basic format and content of control reports in the attempt to assess operating results more precisely by pinpointing responsibility through the detailing of expense incurrence. From an operating standpoint, the reports served a useful purpose, but it was still felt that improvements could be effected and an all-inclusive system of reporting could still be developed.

The system that we were directly concerned with had to provide a more meaningful report for all levels of Aviation Department management and still be separate and distinct from the Authority's general accounting system. The general accounting system is uniform for all our facilities: Marine, Aviation, Tunnels and Bridges, etc.

The Management Financial Control System (our name) that we undertook to establish and perfect was designed to provide the Director of Aviation and his operating management with quarterly reports that would enable them to determine those specific revenue producing facilities of the airports where net revenue production was less than the minimum standards established by Departmental or Port Authority policy. We wanted a system of reports, which when promptly and accurately provided, would supply management with a means to pin-point net revenue deficiencies and point the way for corrective action. Moreover, it was also planned that future budgets for each facility at each airport would be evaluated on the basis of net revenue production. A periodic review by management of financial results would identify specific areas of and reasons for variance from goal.

The first step in setting up the Management Financial Control System (MFCOS) was the renumbering of what we refer to as the Airport's cost centers into a codified system that would allow for a more uniform and systematic evaluation of an airport. This had to be accommodated within the parameters of the existing Port Authority accounting system. This system had already been established and was in use for the accumulation of construction costs and for the recording of revenues and expenses by Data Processing. Our approach was first to group all homogeneous geographical areas, services, structures, facilities, etc. into a 3-digit numbering system identified by a "100" series. This we referred to as "Management Control Groups."

Next in the program we sub-classified the Management Control Groups into what we refer to as "Management Centers". This was accomplished by dividing each "100" series into a series of "10".

Within each series of "10" further identification was enabled by assigning single digits to individual "Cost Centers" of Airport.

The broad Management Control Groups ("100" series) were given titles which, are self-explanatory:

- 100 General Airport Operating Expenses, Systems, Port Authority occupied areas
- 200 Public Aircraft Facilities
- 300 Passenger Terminal Facilities and Services
- 400 Hangar and Cargo Facilities
- 500 Other Aviation Facilities
- 600 Industrial and Commercial
- 700 For accumulation of Special Items of Expense
- 800 For expenses recoverable from Tenants and Others
- 900 For Accumulation of expenses included in Major Work Program

Selecting, for example, the Hangar and Cargo Facilities ("400") Management Control Group at JFKIA, we established Management Centers as follows:

- 400 - Exclusive Hangar - U.S. Flag Carriers
- 420 - " " - Other

Skipping to Cargo, the following were assigned:

- 460 - Exclusive Cargo & Cargo Service Buildings
- 470 - Multi-Occupancy Cargo Buildings

Within the Exclusive Cargo & Cargo Service Buildings' Management Centers, the following Cost Centers would identify the respective structures as follows:

- 461 - Cargo Building - BOAC
- 2 - " " - PAA
- 3 - " " - Emery Air Freight
- 4 - " " - Air Express Int'l.
- etc.

We then felt that the next requirement of the program was to develop a method of arriving at what we in the Port Authority refer to as "Revenue Margin," a measure of a Management Center's Performance. Stated in its simplest terms, "Revenue Margin" is merely the residual amount after deducting expenses from a center's Gross Revenues. However, the determination, if it was to have any merit, had to reflect an assessment of both direct expenses and a distribution of indirect or general airport expenses wherever feasible.

The distribution of these indirect or general expenses (normally coded to the 100 series of Management Control Groups) was considered to be prime objective if the financial results of each Management Center's operation were to be measured in a definitive manner. We were also striving to establish specific guidelines aimed at stating revenues and expenses in a simplified and interrelated set of

reports organized to correspond with management responsibility.

General Expenses were categorized into two basic groups:

1. Costs which could be either directly or indirectly associated with the Revenue Producing Cost Centers of a management center.
2. Costs which would not be distributed but used only in measuring the overall Airport's results. (An example of this type of expense would be the Airport Managerial costs).

In the Port Authority, specific types of work or activities engaged in had already been classified with specific code numbers similar in nature to the previously mentioned Center numerical system.

As an example, the "Activity" number for say Electrical Maintenance is 35 and if the work was undertaken in a specific cargo building, the Electrician would code his time to 462 if it was the Pan American Airlines Cargo Building at JFKIA. This is a direct cost. However, the supervisor or Electrical Foreman who operates throughout the Airport checking on the individual crews would normally code his time to the General Area Cost Center within the General Airport Operating Expenses. The same would hold true for other costs involved in the function for Electrical Maintenance that would not previously be specifically identified with a particular cost Center. This "Direct Supervision" could involve equipment or instructional manual writing, inspections, meter reading, periodic routine servicing on a cyclical basis, etc.

Naturally, over a reporting period these expenses coded to a General Area Cost Center add up to substantial sums, especially so when we take into account the

many similar type Activities that could be involved with the operation of an Airport, e.g. Janitorial, Mechanical Maintenance, Structural Maintenance, Paving Maintenance.

In setting up our control system we proposed that these expenses would be distributed on a direct charge basis as incurred by these Activities for all other cost centers.

Another closely related aspect of supervision that also required distribution since it too was normally coded to a General Area Cost Center is "Unit Supervision". Since I have used Electrical Maintenance as an example, let us continue with it. Within the Electrical Maintenance Unit the Managerial Staff or General Foreman (Unit Supervision) would also code their time to the General Area Cost Center. However, in this case the "Activity" number they would use would be 01 to identify Administrative and Clerical expenses. Naturally it was felt that "Unit Supervision" had a direct relationship to both "Direct Supervision" and the "Direct Cost" of the Electrician Maintenance Unit. Accordingly, the Unit Supervision costs were to be distributed on the basis of all direct and previously distributed expenses.

Following the general rationale of maximum distribution, some determinations had to be made to account for the distribution of other costs coded to the General Area Cost Center. Such costs, for example as:

Policing and Traffic

Snow and Ice Removal

Emergency Service, Etc.

- 1 -

In some cases the coding is done in this manner due to the type of expense involved. In others it is due to what we refer to as an "Ease and Economy" treatment. Briefly, this applies to charges which would normally be broken down daily in the field but which follow a consistent pattern making it possible to get effective distribution to Cost Centers affected.

As an example, no doubt you have all heard how the N.Y.C. areas can be inundated with a blanket of white that can result in a black day for our airport operations. Such being the case, an Airport Manager looks out the window and says "issue mittens and shovels to everyone." Snow Removal gets underway. All crews know the routine -- Runways, Apron, Roads, etc. Now just picture this: A plow operator has removed snow from a runway and is just about to roll on to an apron. He stops, pulls out his time card and says "Now I just left the runway, it is 10:31 PM. I started at 8:14 so that's 2 hours and 17 minutes on Public Aircraft Facilities." Multiply this by the entire snow removal crew, add to it another inch of fallen snow and the result is a financial reporting chaos. If, on the other hand, management knows the routine, priority, total cost involved, etc., predetermined distribution ratios can be calculated and applied to the total cost incurred in behalf of snow removal. By this procedure and with the application of Electronic Data Processing, it is possible to hold field and related office clerical work to a minimum.

In any system such as the MFCS, there are many possible ways of distributing expenses, and there are differences of opinion as to methods. These differences exist within our own staff, among financial people and among airport operators. We recognize that there is no only way nor one best way. The methodology

ultimately used resulted from policy decisions. Our Accounting Department felt, for example, that certain general area charges can not readily be associated with a specific Management Center either on a direct or indirect basis. Included among these charges were for example, Manager's Office Expenses, Aviation Department Staff expenses, other Department's Staff expense, etc. The accountants felt that rather than attempt to relate these charges to an individual Management Center they should be considered as general costs incurred in operating the airport. Specifically they wanted these costs classified as "General Airport Operating Expenses" and excluded from any determination of the margin for Management Centers.

Many such points had to be resolved. Some fell within the realm of accounting theory, others concerned themselves with technical data processing problems. Once resolved, the point was reached where all basic planning was finished and the Report Format could be developed. The programmers went to work, the 7070 computer was activated and the statements were forthcoming. The basic purpose of each schedule of the report is as follows:

The "Summary Financial Statement by Airport" - Schedule A was intended primarily for the first level of Management (The Director of Aviation) and for each Airport Manager. This statement contains the components that we normally use in determining operating results and is presented for each airport plus the total Department. It is intended only for Aviation Department internal use and does not represent the official Port Authority of New York and New Jersey comprehensive system of accounting and reporting.

These are the components of Schedule A

I - Gross Revenues - A commodity we would like to have more of or, stated in technical terms, monies received from the sales of services, space, or utilities, as well as from the granting of privileges. It excludes interest, investment and other financial income and is stated before any deductions for expense incurred in providing such services, space, materials, privileges, etc.

II- Facility Direct Expenses (segregated into:)

1. "Field Units - Direct" which incorporated all costs directly identifiable with a specific Management Center.
2. "Field Units - Supervision" which includes all facility unit costs (exclusive of the Manager's units and staff units) charged to the General Area and distributed to Management Centers in which direct costs have been incurred.
3. "Field Units - Administration" which includes all Manager's units and staff units considered as the administration cost of the entire airport. As I have previously stated, according to our accounting practice these costs were to be excluded from any determination of a margin for Management Centers. Hence, they are not distributed.
4. "Aviation Staff Direct" which includes all staff costs incurred specifically for an individual airport. (These costs are generally main-office Aviation Department, some of which might be directly charged to Management Centers or on the other hand, coded to Cost Centers classified under General Airport Operating Expenses, with the ultimate effect of not being distributed.

5. "Other Staff Direct" which includes other department charges also incurred specifically for an individual airport, i.e. Engineering Accounting, Real Estate, Law, etc. As with Aviation Staff Direct, some costs might be directly charged while others remain as General Airport Operating Expense.
6. "Fixed Charges" - The Port Authority Consolidated Bond Resolution accounting principles provide that operating expenses shall not include any allowance for depreciation; that the monies remaining after payment of each facilities operating expenses shall be pooled and pledged to pay the debt service of the outstanding bonds. It is impossible to identify the individual bond of a particular series that is invested in an airport or other Port Authority Facility. Hence, actual debt service for a particular facility cannot be determined.

In order to overcome this obstacle we have had the electronic people use their machinery to compute, on an equal annual payment basis, an estimated allowance for interest and amortization, over an estimated service life assigned to various types of property. It must be emphasized that these fixed charges are used strictly for management control purposes since the estimated service life of a physical asset bears no relationship to the amortization period of the bond issue. The life of the bond issue, however, will not be longer than the weighted average life of the mixture of properties in which the bond proceeds are invested.

- III. "Total Facility Direct Expense" - An acceptable total of II - if they do not exceed I.

- IV. "Facility Margin" Being optimistic, we refer to the residual amount (after deducting Facility Direct Expense from Gross Revenues) as Facility Margin. Pessimists might add "or Deficit".
- V. "Prorated Expenses" provide for costs related to functions which are centrally performed by Staff and Other Departments for the benefit of Airports and charged to the Aviation Department. Since the costs incurred serve more than a single airport, they are distributed by the Accounting Department to the respective airports on a uniform basis of cost determination which I will go into a little more deeply later on.
- VI. "Operating Margin" - At this point, we can now determine the net return from the airport after deducting all directly incurred expenses and expenses prorated to it in accordance with the Port Authority's Accounting System.
- VII. "Coverage Ratio x Fixed Charges" - Stated in its simplest terms this is nothing more than a "How goes it?" benchmark or arithmetic tool of measurement, determined by dividing Fixed Charges into Operating Margin. In the general accounting field, it might be likened to the "Acid Test Ratio", other "turnover" ratios or measurements of earnings.

I think you will agree that the summarizing qualities of this statement provide management with a ready relationship of revenues and expenses for assessing effectiveness in achieving a planned operating margin and in determining the major overall results on a consolidated basis.

The next statement Schedule B "Revenue Margin by Management Center and Facility Margin" was designed primarily for the Facility Manager. This report presents sufficient detail for each Management Center so that those not attaining

anticipated results are readily apparent. By segregating the costs - Field, Staff, etc., the reason for deviation can be determined and, if warranted, corrective action taken.

We have also incorporated into this schedule an adjustment or transfer from one center to another. Assume a Terminal Building consists of 10,000 square feet of which 1,000 square feet of its rentable area is occupied by Port Authority staff, a transfer of 10% of all related costs will credit costs out of the Terminal Building and charge them to a respective Cost Center assigned to accumulate these costs. Thus, the margin results of the Terminal Building are not penalized. (Generally, the reassignment would be to one within the "100" series or General Airport expense of the Management Control Groups).

The schedule titled "Field Unit Expenses by Management Center" -- Schedule C, summarizes by Center each field unit's actual expenditures for both labor, materials and services and compares the sum to the budgeted amount. Again, we felt that the data presented in this statement would provide a timely feedback of information to the responsible unit head (as well as other levels of management) for problem identification and corrective action.

Historically, airport managers have believed that financial performance should be measured on those expenses for which they could be deemed responsible for over which they exercised control. Unfortunately a line of demarcation is virtually impossible to draw. As an example, in every business or organization, auditors periodically "make the scene". No one ever asks for them but there they are together with their related expense. Accordingly, for the airport manager's benefit we designed and included Schedule D - "Staff Unit Direct Expenses by Management Center". This single source document enables the Manager to determine the impact of expenses charged by Aviation Department Main Office Staff as well as other Department Staff units to his Airport. This report provides the manager with a better means of assessing the benefit derived vs. the cost incurred.

As I stated in the beginning, our concern had been to design and provide a more effective report for all levels of Aviation Department management.

We feel that we have accomplished this objective since the reports:

1. Facilitate better budgeting
2. Provide effective financial control
3. Identify to whom inquiries should be channeled
4. Provide information on a uniform basis
5. Are speedily calculated and produced with the aid of E.D.P.

Naturally a certain amount of debugging was required once the reports were issued. Most problems were commonplace and easily rectified. However, one factor presented a problem of continuing concern -- The Management Control Reports contained no provision for distributing to Revenue Producing Management Centers either some of the General Airport Operating Expenses or Prorated General Expenses which are detailed respectively in Schedule A and Schedule B. For example, within the category of General Airport Operating Expenses are costs coded to such Cost Centers as Air Terminal Highways, Utility Systems, as well as other costs such as Manager's Office expenses, etc. that we code to the General Area Cost Center.

Although I have just touched upon it slightly, Prorated General Expenses could best be explained as costs generated by specialized units serving more than a single airport. This could encompass Other Staff Departments as well as our own main office Aviation Staff.

The method for distributing these costs to each airport is on the basis of the proportion that each airport's payroll costs bear to the total payroll for all airports. Payroll is used as the basis for distribution since it is the largest single item of operating expenditures and a reasonable indication of the size of the airport being administered. Consequently, it is apparent that this type of expense would also require distribution to Revenue Producing Management Centers if we were

to determine net results with reasonable precision. However, due to the complexities involved, the planning and development of myriad formulae, their integration into the Data Processing system and the fact that all this would probably have increased preparation and computer time with resultant report delays, we finally resolved to make the final distribution by hand. This is:

1. Those General Airport Operating Expenses (exclusive of City Rent, Systems and Highways and Facility Occupied Buildings) were distributed on the base of Direct Expenses incurred by each Management Center. Included within this type expense would be such items as Manager's Office, Aviation and Other Department Staff expenses coded to the respective airport, prorated General Expenses, etc.

2. An Airport in providing services such as Systems and Highways has to establish physical Cost Centers which do not, in themselves, produce revenue but serve directly certain Cost Centers involved in revenue production. As an example, an Air Terminal Highway System although not revenue producing, incurs cost in its own behalf and serves Cost Centers such as Vehicular Parking Lots, Terminal Buildings, Hangar Complexes, etc. Consequently, it becomes necessary to relate these general costs to revenues in order to determine "Margin". And in this case "Margin" is applicable to the Revenue Producing Area. We toyed with the idea of distributing these costs on complex bases such as frontage, vehicular pavement and so forth, but for the sake of simplicity and uniformity we decided to spread these costs to Revenue Producing Groups on the basis of land square foot measurements since we felt that a geographical base was a reasonable common denominator and would give us realistic results.

The same would hold true for other Systems such as Electric, Gas, and Water which might possibly be distributed on a consumption basis, but the difficulties and costs of implementation and administration looked onerous. So again we settled on the land base method of distribution. Remember, the application was to be a manual one so not programmed for the computer.

At this point, all appropriate distributions can be considered to have been made and the net results for each Management Center are now determinable.

The computer "produced" reports are circulated to various levels of management while these "net" results which distribute the residual general airport expense are prepared in a condensed format and circulated along with explanatory text only to top Aviation management.

As with any system as time goes by minor inadequacies appear but at the same time auxiliary uses of the report are also found. We gratifyingly enough have discovered that the latter far outweighs the former and it would appear that in the Aviation Department of the Port Authority of New York and New Jersey, the Management Financial Control System is here to stay.

I might add that in 1970 our organization purchased a Model IBM 360/75 Central Processing Unit resulting in an increased thru put capacity of between 16% and 19%.

In anticipation of the wonders of this new hardware, our analysts immediately made ready a proposal to our Electronic's Division for inclusion of the "Net" reports into the new computer program or we would request a pre-game analysis of next year's football games as compensation for the extra work involved in cranking out the "net" reports manually. We met resistance on both scores and accordingly, my staff investigated the possibilities of utilizing "time-sharing" computer services. This has lead to further developments in connection with our proposed computerization of the "net" reports. Although some of our endeavors are in the embryonic stage we are rapidly progressing - to the extent that the distributions that were formerly performed manually are now a routine function on a "time-sharing" computer.

We feel that a wide range of applications are available in the future since the "Stored" data could probably be extrapolated and utilized in many variegated ways: e.g., as an aid to rate making; determining cost effectiveness of proposed projects on existing or estimated returns, establishing indices and developing subsequent trends, etc. It is unfortunate that our procedures, which are for the main in the financial field, do not lend themselves to what is commonly referred to in data processing and programming as "canned" or routinely performed established programs. As a consequence, we are doing our own programming and experimentations - oft times on a trial and error basis.

In summation, our computerizations' attempts are starting to be productive. The pencil is being replaced by electronic buttons and keys and hopefully, the end result will allow our staff to spend more time on analytical work.

AIR TRAFFIC FORECASTING
AT
THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

Johannes G. Augustinus

Market Research Approach

The forecasting procedure often referred to as "The Port Authority Model" can basically be defined as a "market research" approach. It differs from most other air traffic forecasting "models" in that it relates air travel growth to detailed socio-economic and demographic characteristics of the U.S. population rather than to aggregate economic data such as GNP, personal income, industrial production, etc.

A series of national household surveys conducted intermittently over a period of some 15 years, demonstrates consistently, although not surprisingly, that a number of basic socio-economic and demographic characteristics have a strong bearing on people's air travel behavior. Chart I demonstrates clearly that such characteristics as age, occupation, education and income are prime determinants of whether a person is a "flier" at all or has as yet never travelled by air. Chart II demonstrates that the number of air trips taken for personal reasons (vacation, visiting relatives, etc.) varies by the same kind of characteristics. Air trips for business reasons, on the other hand, are closely associated with a person's occupation, his level of responsibility, and the type of industry with which he is affiliated (Chart III).

It is for this reason, that the Port Authority forecast divides the air travel market into a large number of travel "cells", for personal travel each defined by a cross classification of age, occupation, education and income criteria, for business travel by criteria of industry, occupation and income.

For forecasting purposes, however, not only differences in levels of air travel propensity are critical, but also differences in growth rates. Chart IV demonstrates that increases in the number of "fliers" in certain economic and demographic groups such as professionals, high income and higher education groups, over the past 15 years have been much greater than in others, such as lower income or education groups, housewives, etc.

Given the historical air travel survey observations over time for various socio-economic groups, the forecaster's problem is to extrapolate these data in some kind of a rational way to a future forecast year.

The initial Port Authority air passenger forecast of 1957 assumed that the rate at which people enter the air travel market (become "fliers") would more or less follow a declining straight line logarithmic function, the so-called "learning curve", i.e. the attrition of the "non-flier" portion of the population was assumed to drop at a constant annual rate, at a fast rate for some cells, at a slower rate for others, (it was assumed that the starting point was 1935). The "flier" portion, being the complement of the "non-flier" portion, was thus assumed to increase at a decelerating growth rate (Chart V).

With respect to the frequency with which air trips for personal reasons are taken, the 1957 Port Authority forecast assumed that the travel frequency within each "cell" would remain more or less constant at the level observed in the 1955 survey. This assumption implied that the most significant factor in the further growth of personal air travel would be the rate of acceptance of air as a mode of travel by former "non-fliers," rather than an increase in the number of trips per "flier."

By 1955, business travel had already reached a fairly high degree of maturity, and the survey showed that most of the people taking business air trips in that year were already "experienced" air travelers. The 1957 forecast simply assumed that the number of business trips per 1,000 people employed in each business travel cell would continue to increase with the same amount per year as it had done prior to 1955 (it was assumed that the number had been zero in 1935).

Actual experience as demonstrated by subsequent survey findings indicates that some of those assumptions were valid, but others required modification.

Chart VI shows that the "learning" curves pretty much have been developing along straight line declining logarithmic curves, although at a somewhat different slope than initially anticipated.

The assumption of a stable trip frequency for personal trips appeared to be reasonably validated by actual survey results up till the year 1965. The more recent surveys suggest, however, that in certain demographic groups, particularly the younger groups, a sizeable increase in trip frequency is occurring, possibly as a result of promotional "youth fare" plans (Chart VII). The most recent forecast incorporates an adjustment for these changes on the assumption that such promotional fares, in one form or another (of equal impact), are here to stay and that their long range impact will spread through the air traveling population.

With respect to business travel frequency, every survey since 1955 has shown that, within each business travel cell as defined by occupation, industry and income, there is a strong tendency for the number of air trips per 1,000 population to stabilize (Chart VIII). This should not be interpreted to mean that business air travel has not grown over the past 15 years. The population in the high travel business cells has increased substantially (particularly with respect to income), and thus, up till now, business travel has managed more or less to hold its own in the air travel market. (a)

Problems an approach like this has to contend with, are those of sample size and sampling variability. The high air travel propensity groups, by definition, find only a relatively small representation in a household survey drawing a cross section sample of the total U.S. population. Moreover, surveys of this nature are costly in any case, and procedures for over sampling the high travel groups usually strain the budget limitations of most forecasters.

At least two approaches offer some relief to this problem. One is to subject the survey data to a regression analysis of one form or another to determine significant relationships between air travel and economic/demographic characteristics on a statistical basis. (b) A second one is to consolidate data from successive surveys. If it may be assumed that no significant trend

(a) Part of the leveling off of the trend in business travel frequency should undoubtedly be attributed to the short comings of income as an indicator over time of people's level of responsibility in a business organization. Besides the problems of inflation of dollar incomes, the continued increase in the general level of real income per capita over time also tends to bring more and more people into higher income groups without a commensurate increase in business responsibility, and therefore, business travel propensity. Nevertheless, under the assumption that this trend, implicitly included in the survey data in the past, is to continue in the future, the procedure should produce an acceptable forecast of future business air travel volumes.

(b) See e.g.: John B. Lansing and Dwight M. Blood, A Cross-Section Analysis of Non-Business Air Travel, Journal of the American Statistical Association, December, 1958, and;
John B. Lansing and Dwight M. Blood, Mode Choice in Intercity Travel: A Multivariate Statistical Analysis, Survey Research Center Institute for Social Research, University of Michigan, 1964.

developed over the period under observation, this may take the form of simple averaging. If trends are evident, trend estimates in most cases will represent more reliable estimates than those provided by the individual survey observations.

A long range air travel forecast should not only concern itself with travel trends within the present demographic and economic groups but also should take into account changes in the socio-economic structure of the population which are expected to take place in the future. Here, the Port Authority relies primarily on the many forecasts prepared by experts in each field, such as population projections and projections of age distributions and education levels by the U.S. Census Bureau, labor force projections by the U.S. Bureau of Labor Statistics and economic projections by government bodies and private organizations.

Those familiar with these data sources will recognize that the combination of the various population data into a format which meets the requirements of the Port Authority air travel forecast (the "cell" format) sometimes poses problems and requires some approximations in the details. Nevertheless, it is felt that the data are fully adequate to arrive at a projection of the future air traveling population, even though various travel cells may continue to pose statistical problems. As an example, a table is attached from the 1957 forecast report which shows the initial breakdown of the personal travel market population into 134 cells.

By applying the data on air travel experience and air travel frequency to the projected future population for each travel cell, the future trip generation for all cells (essentially sub markets) can be estimated (Chart IX). It should be mentioned that to the extent that individuals are moving up the socio-economic ladder, which is primarily through age, increasing income and, to a lesser extent, continued education, the forecast assumes that they adopt the air travel characteristics of the socio-economic cell into which they move.

In combination, the total of these cell estimates produces a national air travel forecast in terms of the number of trips to be taken in the forecast year.

The most recent Port Authority forecast which was prepared in 1968 and based on data through 1967, indicates that by 1980 the "U.S. non-institutional population of 18 years and over" (the population covered by the national travel market surveys) would generate:

94,000,000	personal domestic air trips
<u>45,000,000</u>	<u>business domestic air trips</u>
139,000,000	domestic air trips

After an adjustment for air travel by population groups not included in the surveys, such as children under 18 years of age, servicemen living on post, etc., this number should represent some 165,000,000 domestic air trips by 1980.^(a) As almost all domestic air trips are round trips, this equates to some 330,000,000 domestic passenger enplanements at all continental U.S. airports, which represents a more than doubling of the 150,000,000 U.S. enplanements reported during the last couple of years (Chart X).

The principal merits of the market research approach outlined are two-fold:

First, it enables the forecaster to identify in considerable detail which market segments have generated most of the air traffic growth in the past. By inflating the survey data to reflect the total U.S. population in actual numbers in the survey year, it is possible to find the approximate representation of each population component in the air travel market in any given survey year and, from the changes over time, to determine which segments have contributed most of the traffic growth.

(a) The 1968 forecast was reviewed in 1970 when new survey data for the year 1969 became available. The new data appeared not to warrant changes in the 1968 projections. A new travel market survey is planned for the second half of 1972.

Secondly, the approach enables the forecaster to identify which market segments offer the best prospects for further traffic growth and which markets don't. The growth markets of the past do not necessarily constitute the growth markets of the future. The very fact of their rapid growth may indicate an approaching level of saturation, limiting the potential for future growth. Other markets will have a limited growth potential by the very nature of their composition such as low income, low education levels, less mobile occupations etc.

The forecaster's objective should be to identify those markets which, because of their demographic and economic composition and their stage of development, offer the best opportunities to produce the traffic growth of the future, and to measure the most likely magnitude of that growth.

A weak point of the "model" is that it does not include any explicit expression of past or expected changes in air fares or some other measure of the cost of air travel. This does not mean that it does not recognize the effect of such changes or assumes no changes in the future. As all observations on the growth of air travel in the various market segments (cells) were taken under varying levels of air fares and other cost elements, an extrapolation of the trend in the observed data does mean that the forecast implicitly assumes some kind of a continuation of the past trend in the cost of air travel (depending on the "shape" of the extrapolation).

A similar comment could be made with respect to the trend in improvements in service such as reduced travel times, greater dependability, improved comfort etc. Also here, the implicit assumption is that such improvements will continue to occur more or less at the same rate as they occurred in the past (again, depending on the shape of the extrapolation). If anything, one may be tempted to characterize this at the present stage as an optimistic assumption.

Some Econometric Approaches

It is especially the lacking of an explicit price factor in the market research method, as it now stands, that has led the Port Authority to explore some avenues of the more conventional econometric techniques as supplementary forecasting tools.

Chart XI shows the results of a (percentage) first difference regression analysis ("delta-log-model") to deseasonalized quarterly U.S. domestic passenger miles data over the period 1949-1969. As variables, this particular model includes (deflated) national income, (deflated) average yield per passenger mile and a (logistic) trend. The analysis also provides for distributed lags of the "Almon" type for the income and price variables.

Even if a "first difference" formulation is in the first place a short term forecasting tool, it is helpful in evaluating observations in any individual year in their relationship to the long range trend as it attempts to determine which part of the fluctuations in the growth rates is caused by short term fluctuations in the economy and changes in air fares (it is recognized that first difference models may have "bias" problems). This is particularly helpful in evaluating more precisely specific observations in each of the successive market surveys as to their meaning in relation to the long range trend.

Chart XII shows the results of a logarithmic "level" (rather than first difference) equation, including the logs of (deflated) GNP per capita and average yield per passenger mile, a trend and three quarterly dummy variables. It also provides for distributed lags of the "Almon" type for GNP and air fares. Whereas a "first difference" model may have bias problems in the estimation of

of the coefficients, a "level" model in a case like this has to contend with the familiar problems of inter correlation between variables. The values of the coefficients and standard errors appear, however, acceptable and the overall "goodness of fit" is extremely good ($R^2 = .99$).

An equation like this is in the first place, again, most helpful in evaluating short term observations in their relationship to the long range trend, where one probably could live with some multicollinearity problems.

One is, of course, easily tempted to make a long term projection on the basis of an equation of this kind. Although multicollinearity problems should be recognized and the risk they involve for long term projections, it is encouraging to find that under two alternate assumptions with respect to GNP growth (high: 5 per cent annually, low: 4 per cent) and with respect to the future level of air fares (optimistic: 3 per cent reduction annually in constant dollars; pessimistic: constant level in constant dollars throughout the forecast period), the 1980 forecast level ranges between 459 and 284 million passengers (Chart XIII).^(a) Although the wide margin between the two estimates is concerning, it is at least reassuring that the high and the low estimates bracket the results of the market research approach. It appears that by now the data base for both methods is sufficiently broad that they produce results in the same general area.

Basically, the present status can be summarized as follows:

The market research approach deals explicitly with considerable detail

(a) This assumes an increase in average length of passenger trip of 12 per cent over the period 1970-1980.

in socio-economic and demographic trends but lacks explicit expressions for short term fluctuations in the economy and for the cost of air travel.

The most commonly used aggregate econometric approaches, on the other hand, deal explicitly with aggregate economic indicators and with the level of air fares, but lack the significant socio-economic and demographic detail which in long term projections may be of overriding importance.

Obviously, a promising avenue for further development work in the area of forecasting techniques would appear to be to search for some merger of methods which employ aggregate economic data and data on the cost of air travel as well as socio-economic and demographic data as developed by travel surveys.

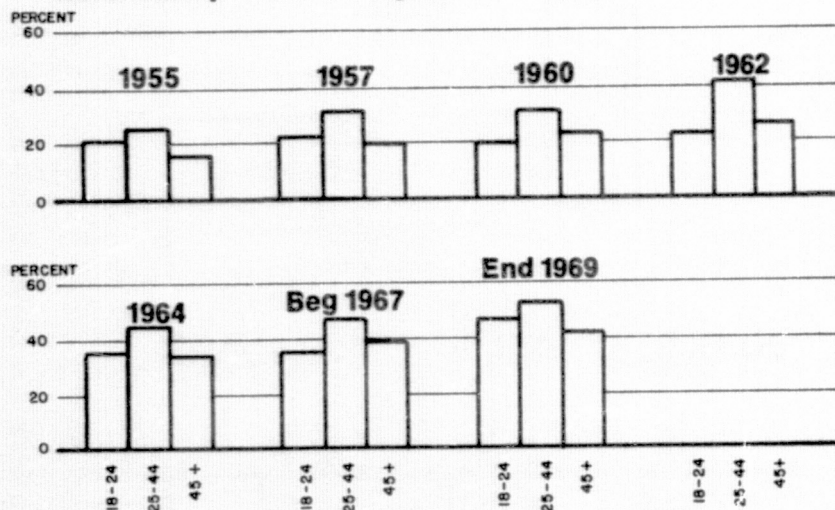
One such approach which the Port Authority is currently pursuing is to analyze historical trends on principal New York routes (city pairs) using both regional economic data and demographic and socio-economic data on air travelers on such routes as collected in the Port Authority in flight surveys. This work has, however, not progressed far enough that results can be reported at this time.

The Port Authority of New York and New Jersey
Aviation Economics Division
July, 1972

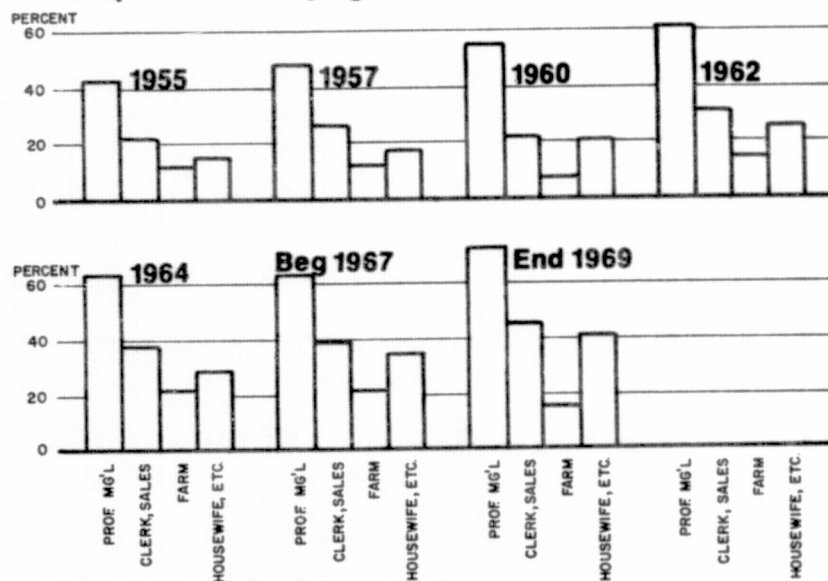
Seven Surveys Show Similar Relationship Between Selected Characteristics And Flying

EXPERIENCED FLIERS AS PERCENT OF TOTAL POPULATION

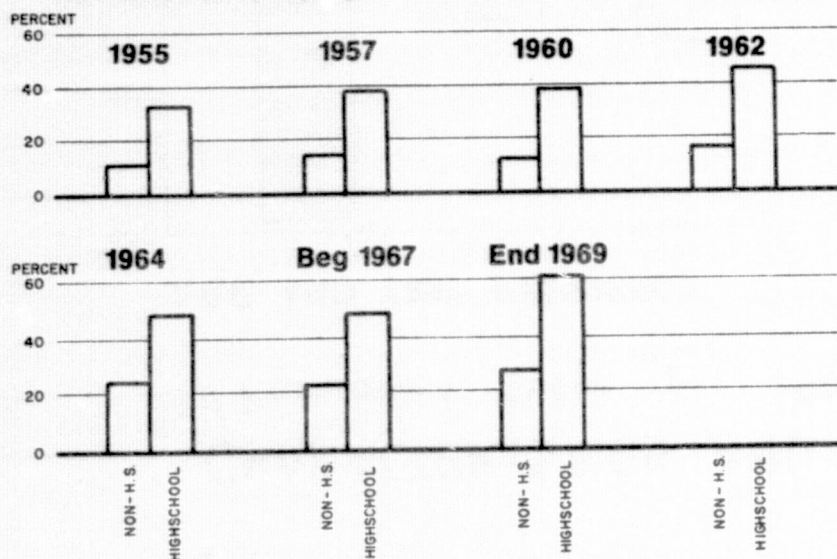
Relationship Between Ages And Flying



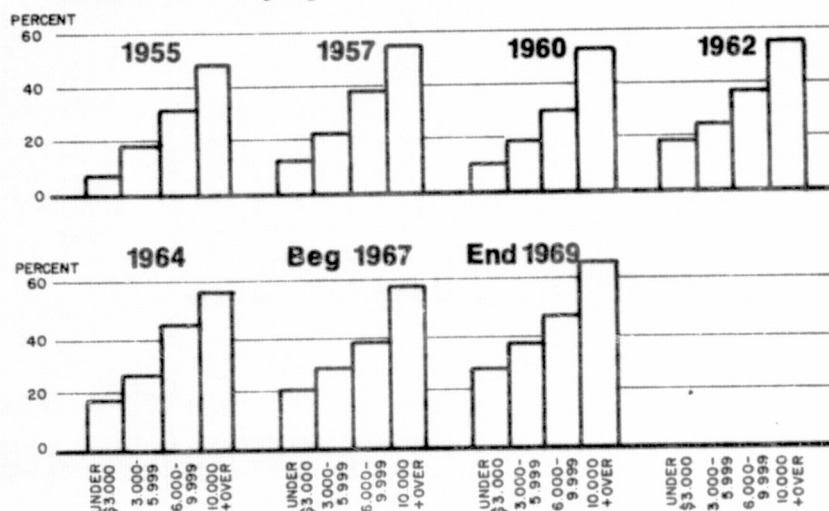
Occupation And Flying



Education And Flying



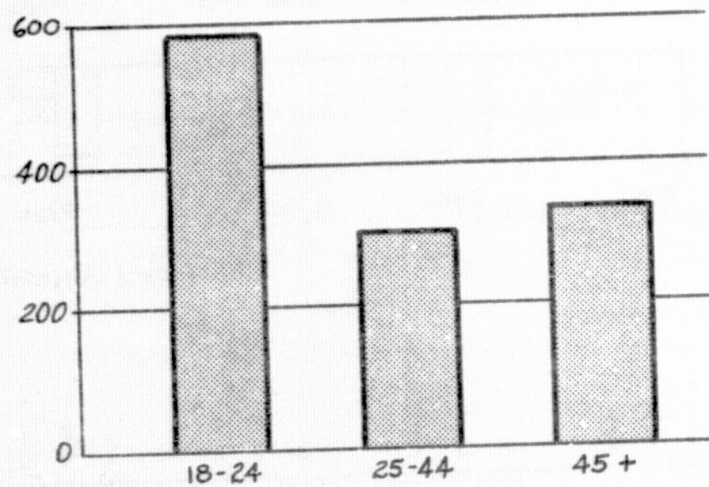
Income And Flying



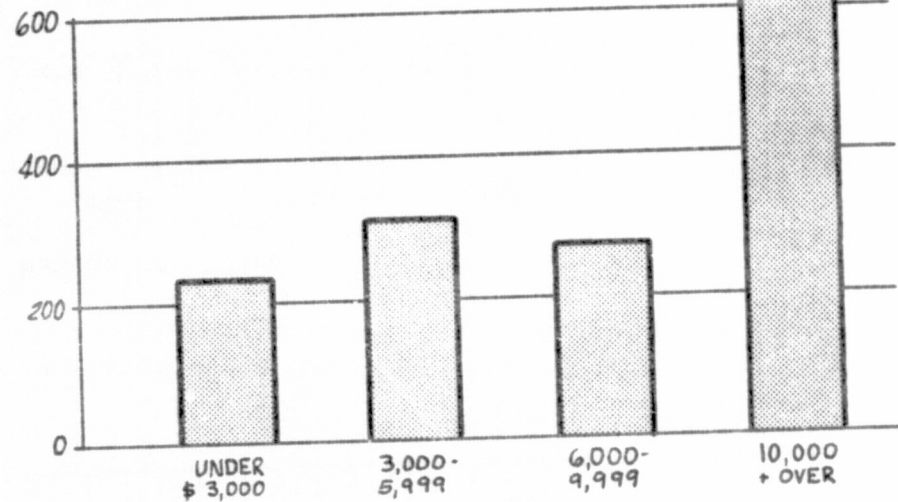
CHARACTERISTICS AND TRIP FREQUENCY

(Personal Trips per 1000 "Fliers")

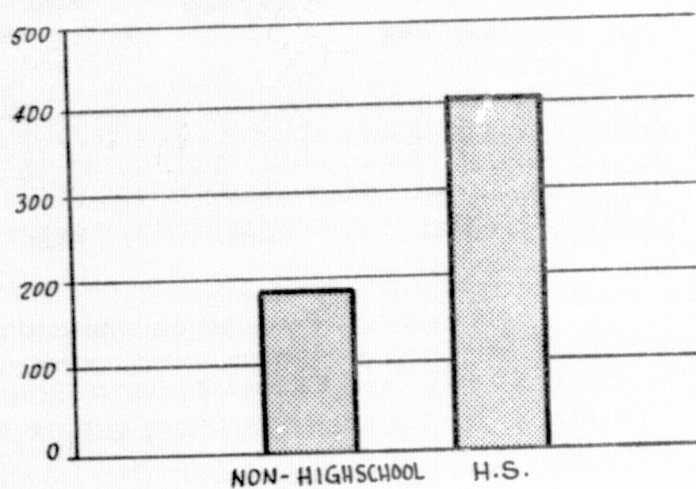
AGE AND TRIP FREQUENCY



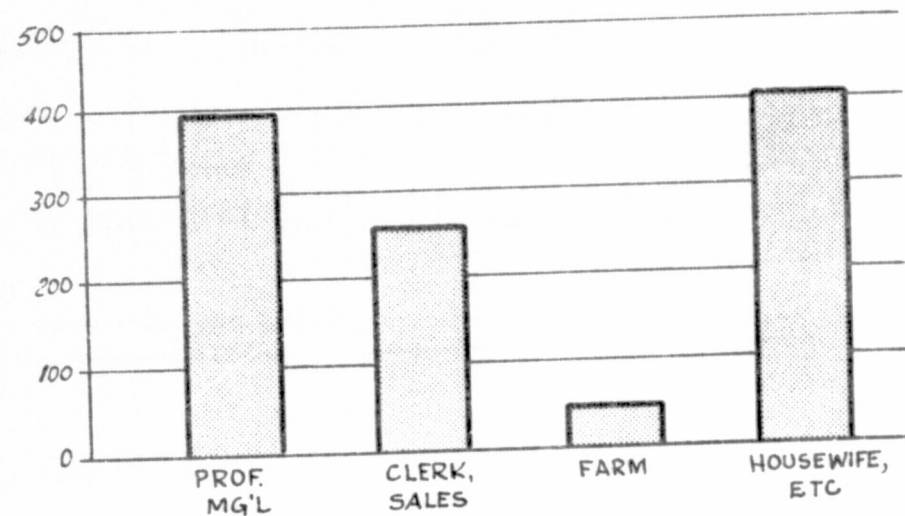
INCOME AND TRIP FREQUENCY



EDUCATION AND TRIP FREQUENCY

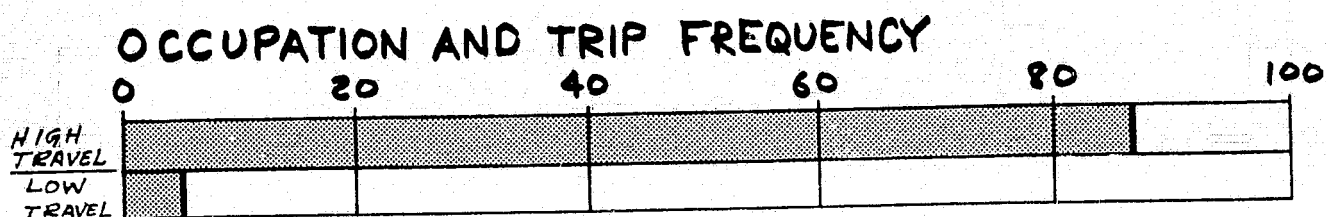
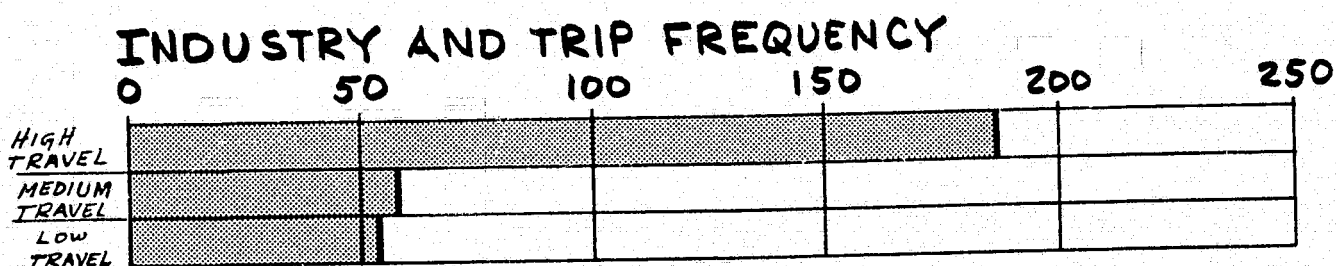
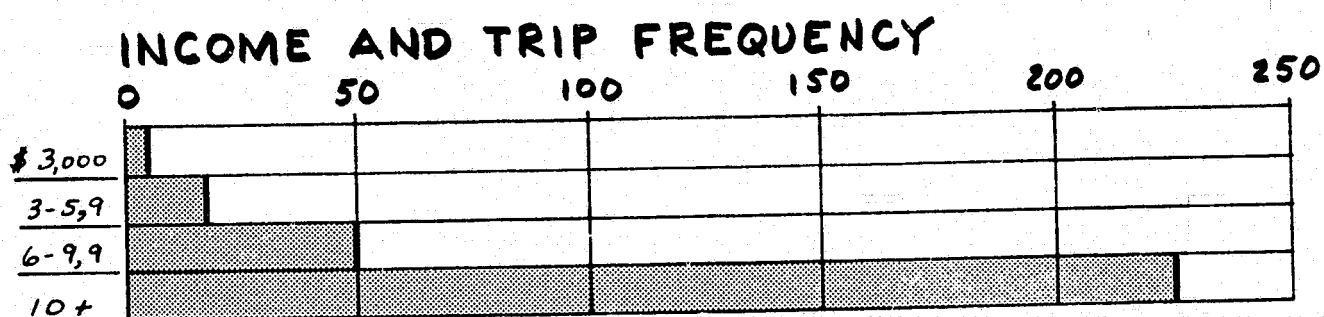


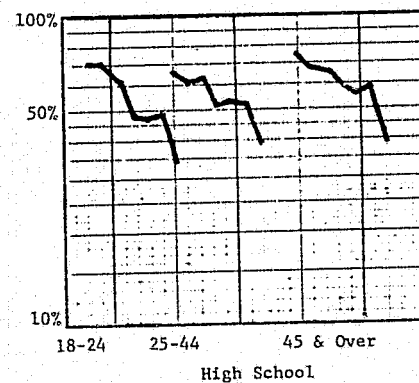
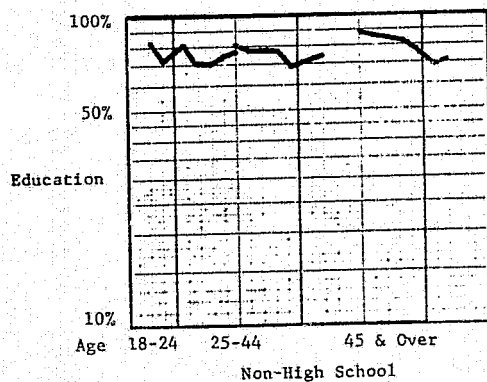
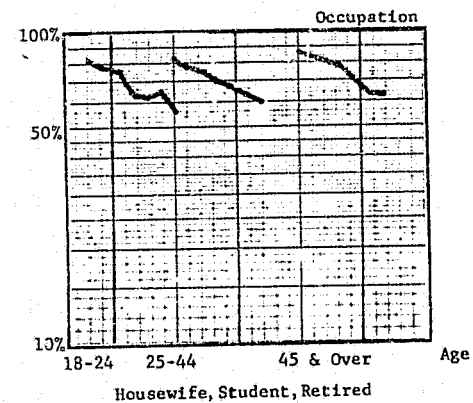
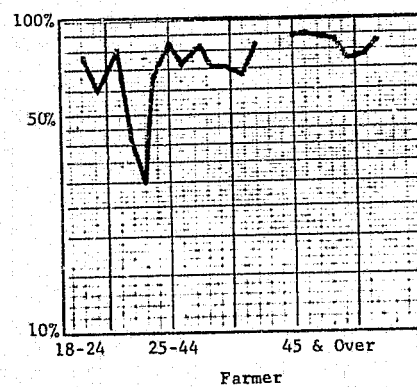
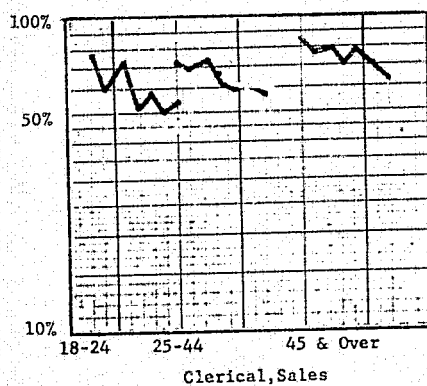
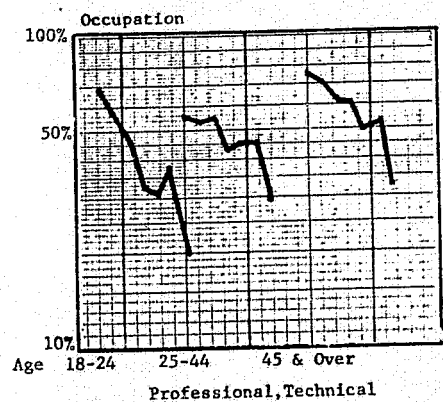
OCCUPATION AND TRIP FREQUENCY



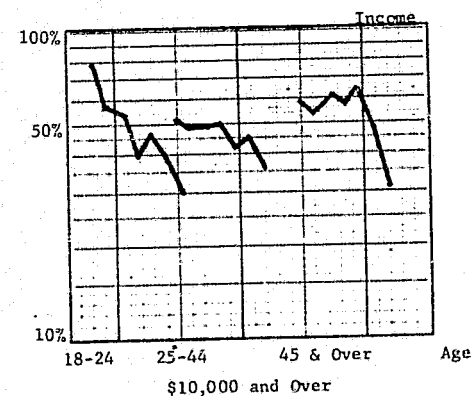
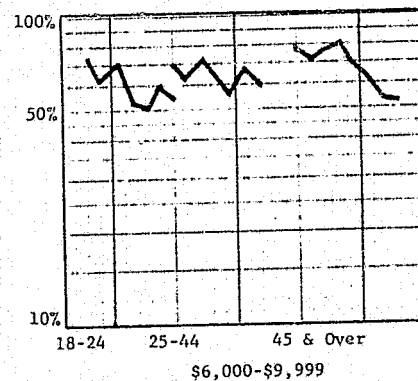
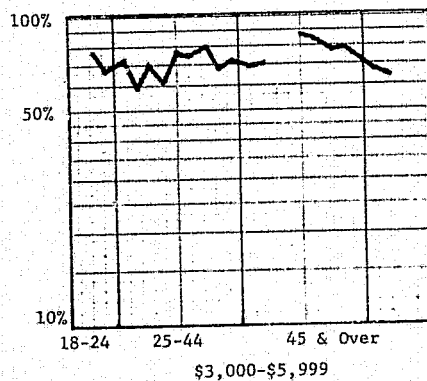
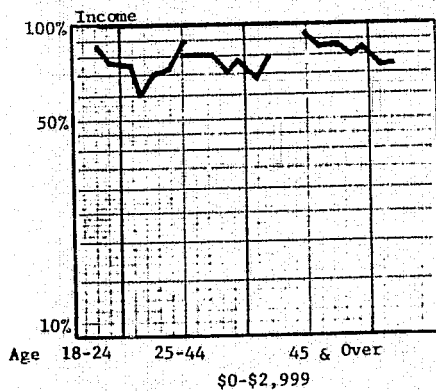
Characteristics And Business Trip Frequency

BUSINESS TRIPS PER 100 ADULTS

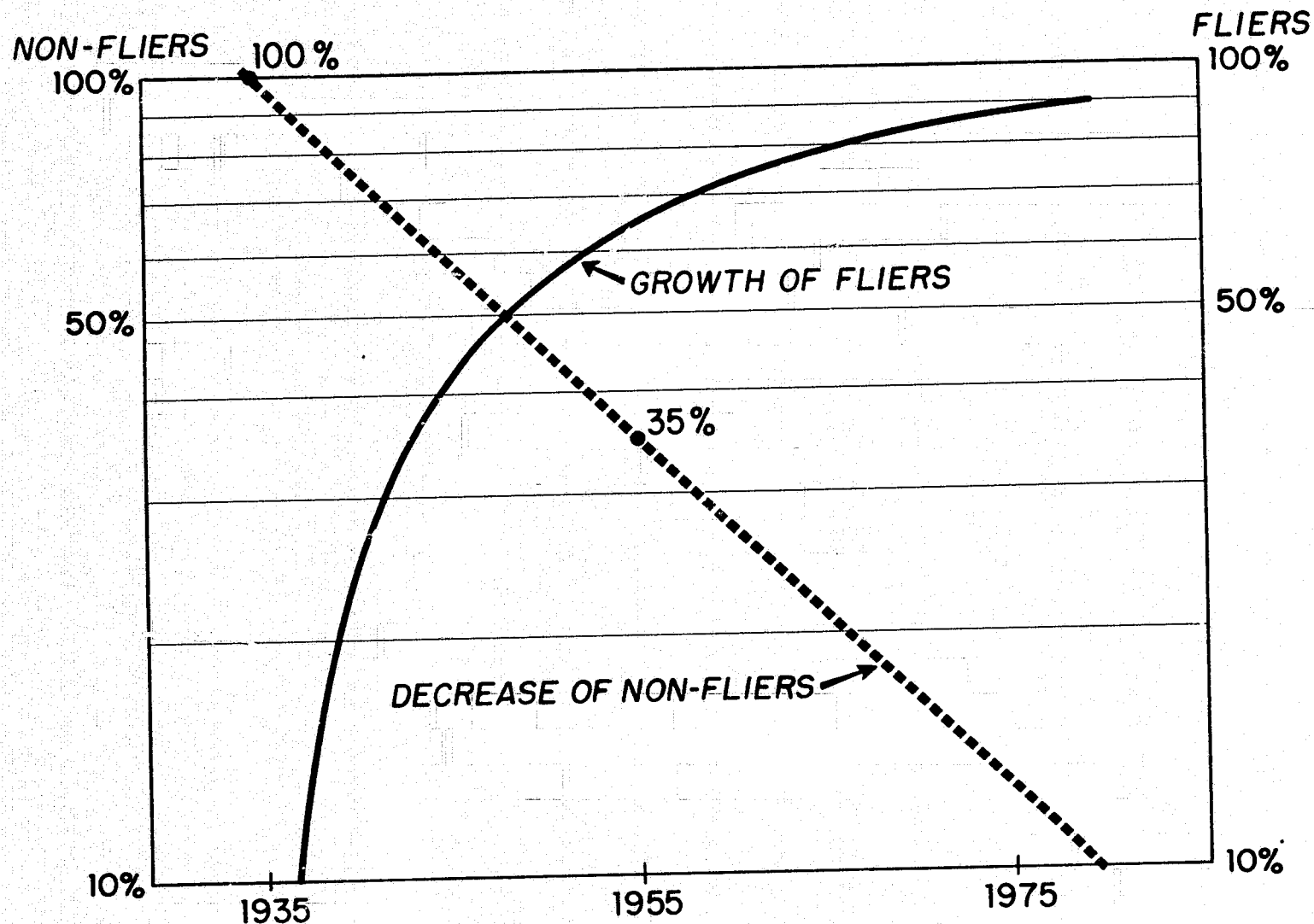


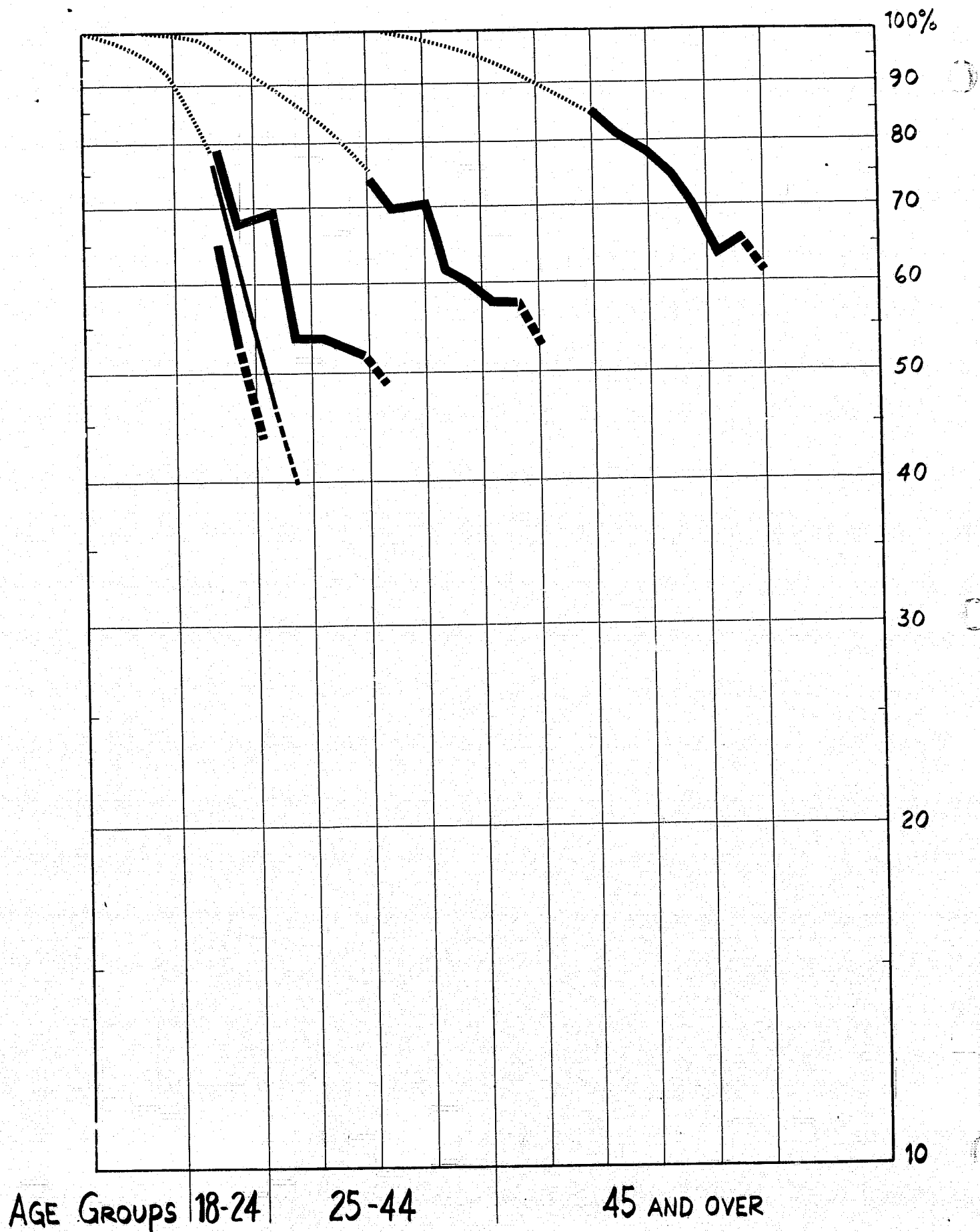


Education

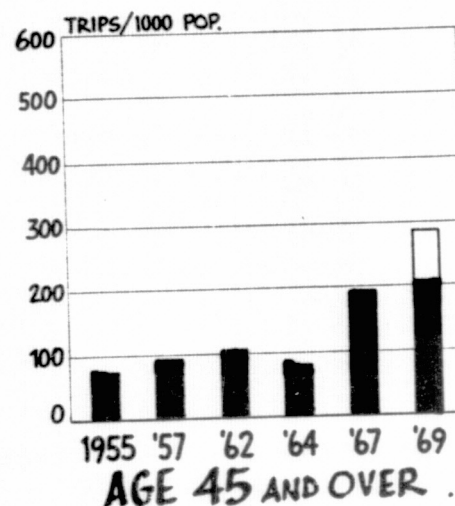
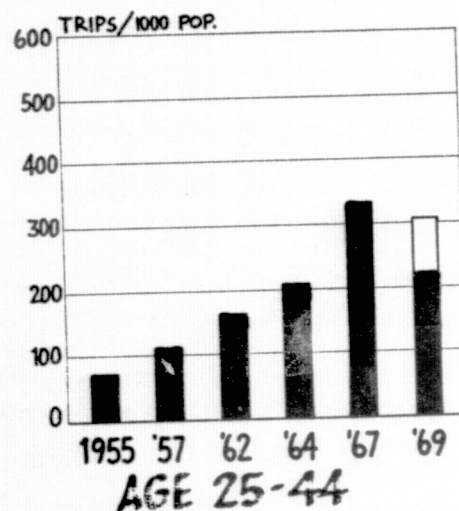
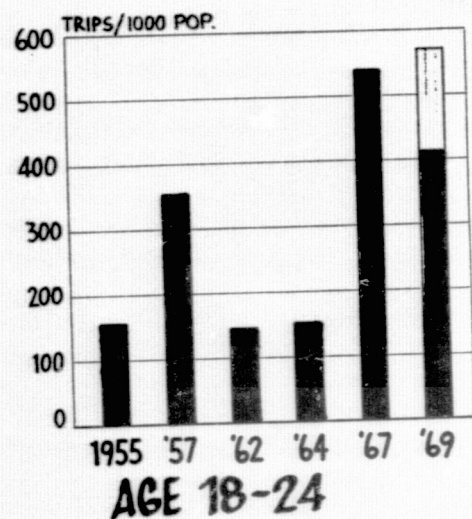


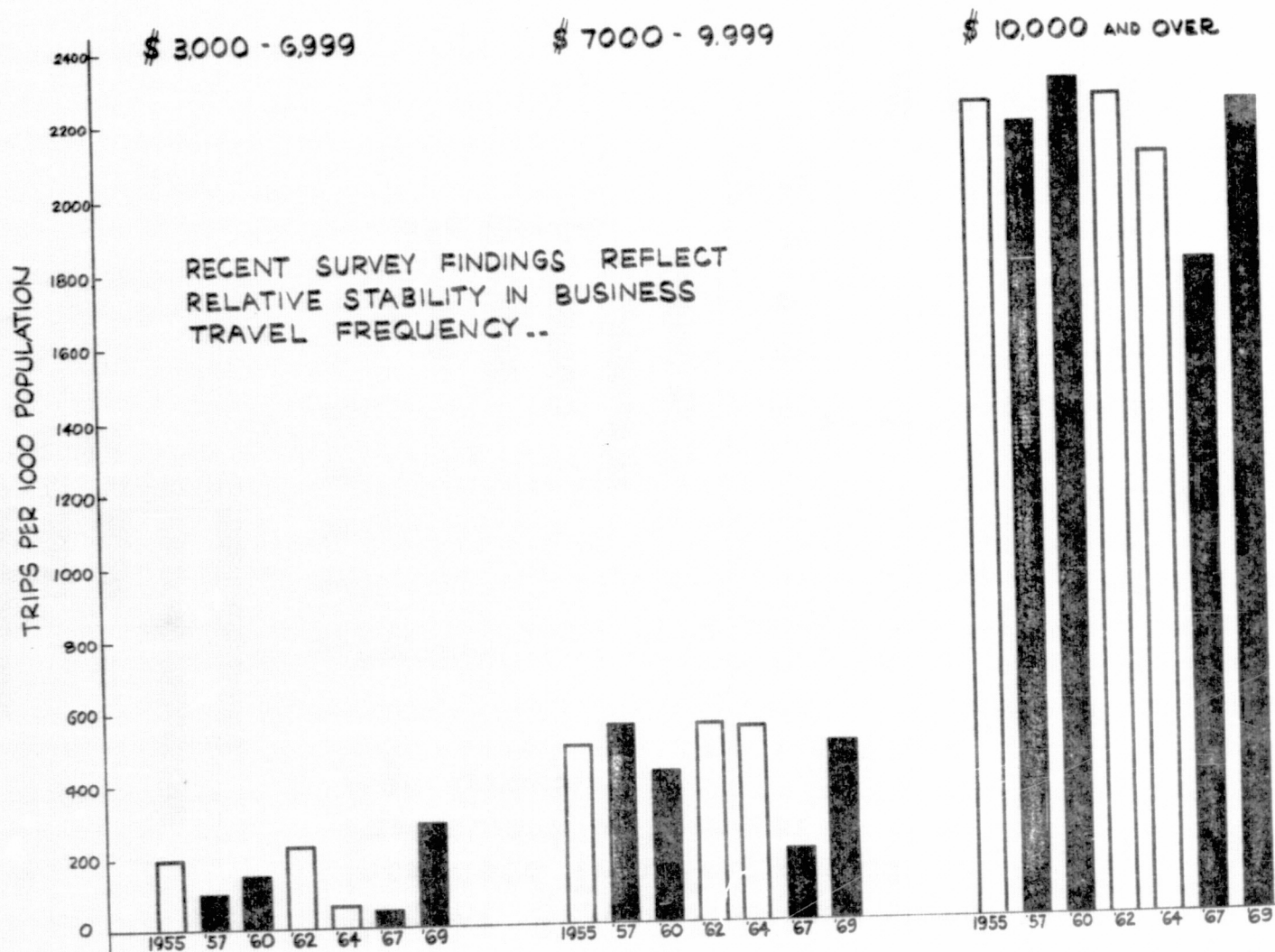
**A CONSTANT PERCENT DECREASE IN NON-FLIERS
IS A DECLINING PERCENT GROWTH IN FLIERS...**





Recent Survey Findings Show
Increased Trip Frequencies
Particularly in Youngest
Age Group.





FOR --- A PERSONAL CELL, 1975 ---

2,068,000

Number of people in population.

x 75%

Percent fliers.

1,550,000

Number of fliers.

x 268

Round trips per thousand fliers
in year.

415,000

Number of trips.

COMBINATION OF UPDATED POPULATION "CELLS" AND
NEW TRAVEL FACTORS YIELDS ESTIMATED DOMESTIC
AIR TRIPS BY SURVEY POPULATION IN 1980...

94,000,000 ◀ PERSONAL

45,000,000 ◀ BUSINESS

139,000,000 ◀ TOTAL

ADJUSTED TO INCLUDE
ALL DOMESTIC TRAVEL ▶

164,000,000

x2

328,000,000 ◀ ENPLANEMENTS

U.S. PASSENGER MILES

EQUATION

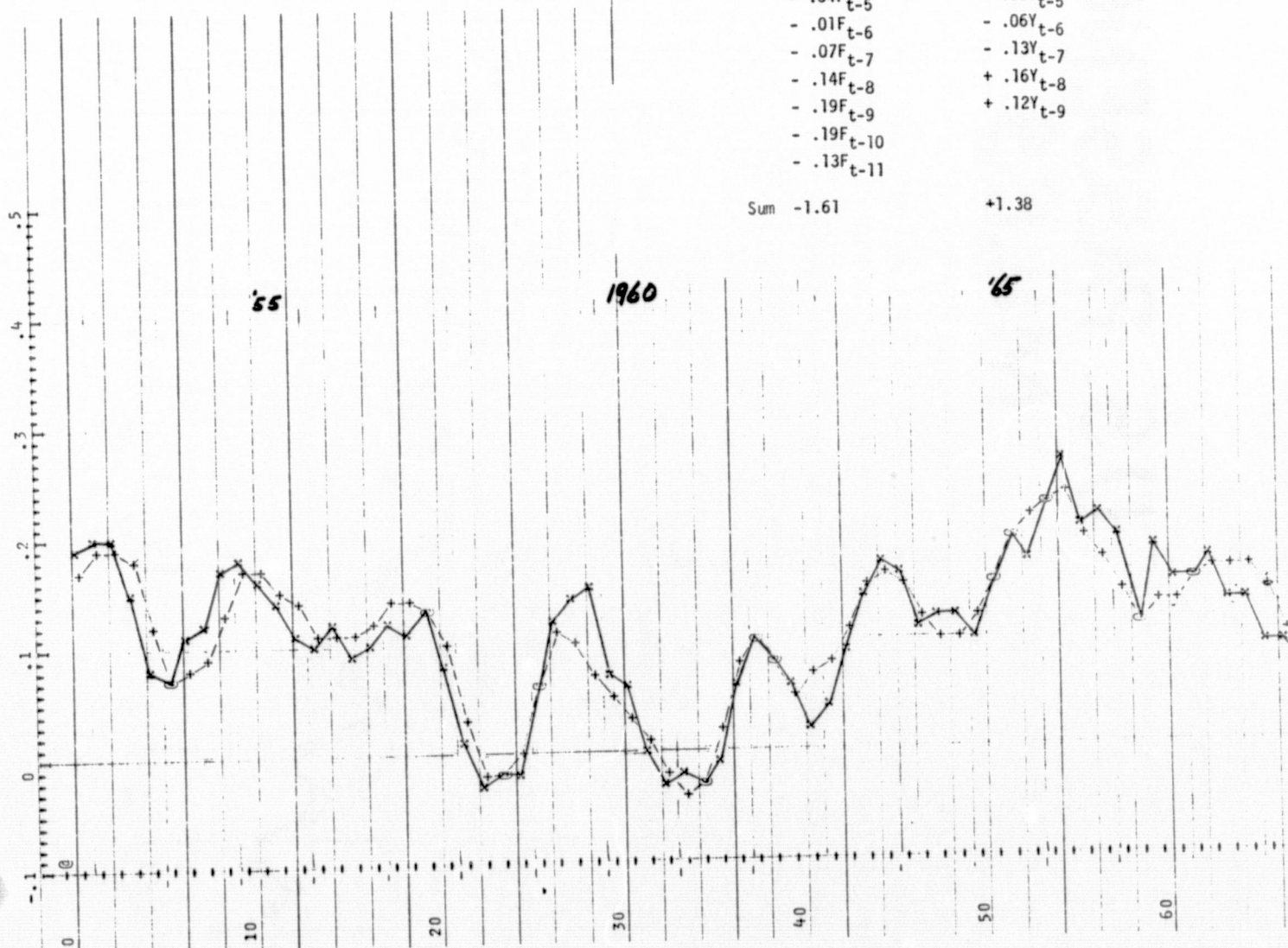
$$\begin{aligned}
 P = & 6.24 - .62F_t \\
 & - .30F_{t-1} \\
 & - .09F_{t-2} \\
 & - .02F_{t-3} \\
 & - .06F_{t-4} \\
 & - .04F_{t-5} \\
 & - .01F_{t-6} \\
 & - .07F_{t-7} \\
 & - .14F_{t-8} \\
 & - .19F_{t-9} \\
 & - .19F_{t-10} \\
 & - .13F_{t-11}
 \end{aligned}$$

$$\begin{aligned}
 & + .63Y_t \\
 & + .28Y_{t-1} \\
 & + .07Y_{t-2} \\
 & - .03Y_{t-3} \\
 & - .04Y_{t-4} \\
 & - .00Y_{t-5} \\
 & - .06Y_{t-6} \\
 & - .13Y_{t-7} \\
 & + .16Y_{t-8} \\
 & + .12Y_{t-9}
 \end{aligned}$$

$$- .004T$$

Sum -1.61

+1.38



U.S. PASSENGER MILES

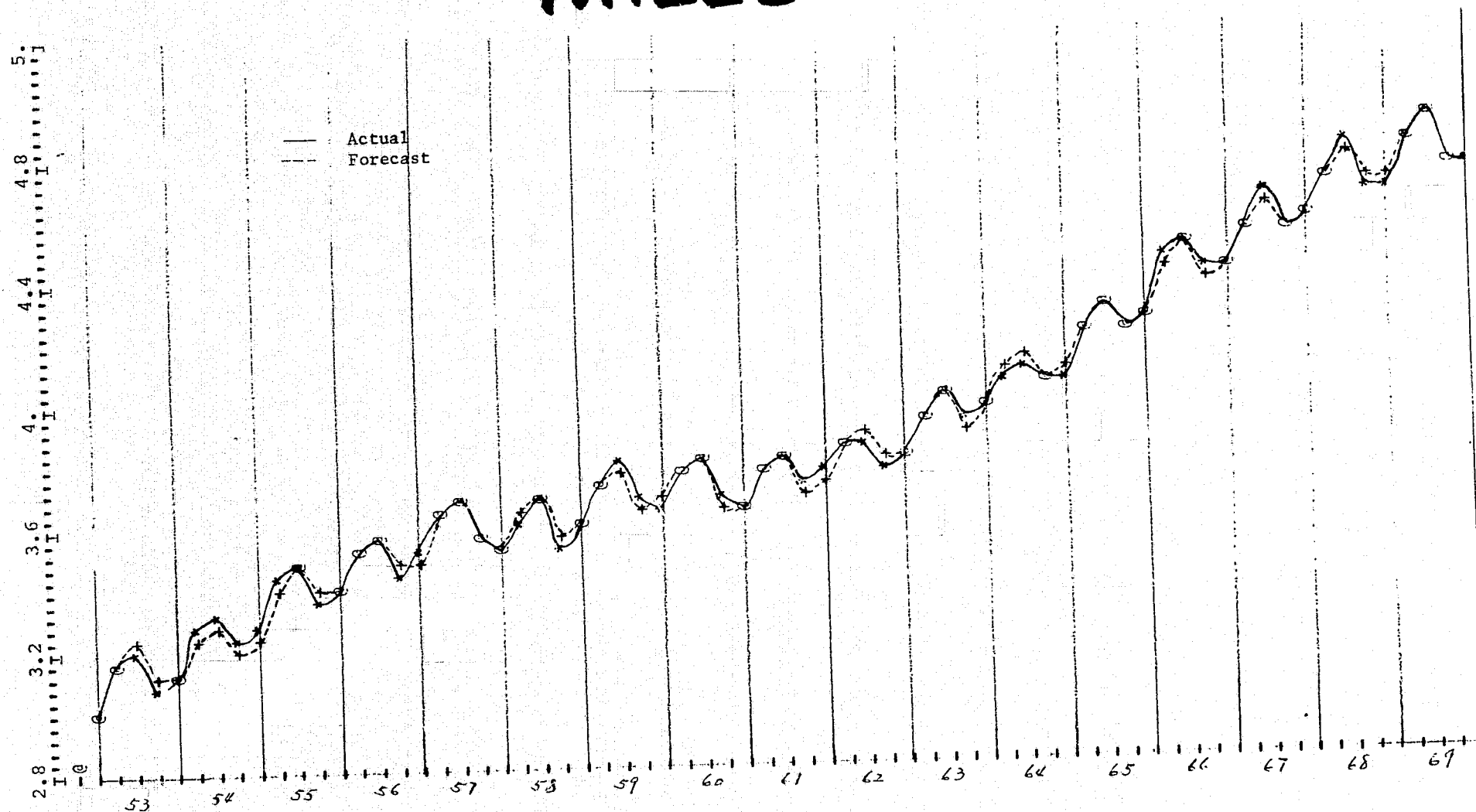


Table IV-2 Long-Term Forecasts

	(miles)		(millions)		(millions)	
	<u>Per Capita Pass.</u>	<u>Miles</u>	<u>Total Passenger Mi.</u>		<u>Number of Passengers</u>	
	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>
70	483.8	483.8	99.104	99.104	149.4	149.4
71	486.4	484.5	100.306	100.306	154.0	154.4
72	543.2	529.2	113.574	110.646	171.3	166.9
73	605.1	567.0	127.796	119.757	189.9	177.9
74	686.9	607.5	146.529	129.582	214.2	189.4
75	781.7	650.9	168.429	140.213	242.7	201.6
76	888.7	697.4	193.408	151.771	275.9	216.5
77	1010.3	756.6	222.070	164.111	313.7	231.8
78	1147.9	798.9	254.852	177.362	356.4	248.1
79	1302.7	854.4	292.117	191.586	404.6	265.4
80	1477.8	913.3	334.709	206.864	459.1	283.8
81	1676.4	971.9	383.500	222.333	523.2	303.3
82	1899.8	1038.7	438.949	239.994	596.4	326.1
83	2151.6	1109.7	502.116	258.965	678.5	350.0
84	2424.3	1185.2	571.399	279.337	768.0	375.5
85	2748.5	1263.8	654.277	300.850	874.7	402.2

173-32-80
Wilson D. Rogers, Jr.

By way of an outline, I would like to mention the administrative framework of the Civil Aeronautics Board, the type of cases that fall within the purview of the Board's jurisdiction, and then discuss in some detail a few specific cases in terms of a civic party's participation.

The Board itself is composed of five members who are appointed by the President and confirmed by the Senate. No more than three can be from any one political party and they are appointed for six-year staggered terms. The six-year terms are not really as firm as they sometimes appear. When I first became involved in the Civil Aeronautics Board work back in late 1967, John Crooker was Chairman of the Board. Under some political pressure, however, he resigned shortly after President Nixon came into office.

The Board itself is composed of five major bureaus: the Bureau of Accounts and Statistics; the Bureau of Economics; the Bureau of International Affairs, which is intimately connected with bilateral treaties; the Bureau of Enforcement; and the Bureau of Operating Rights. The Bureau of Operating Rights, in proceedings before the Board, represents the public interest. The private, profit-motivated sector of the economy is represented in effect by the airlines. The geographic areas are represented by civic parties such as the Massachusetts Port Authority and the Bureau of Operating Rights participates in all of these cases representing the public interest. They are an active party just the same as any airline or just the same as any civic group.

In terms of the types of cases that the Board hears, there are

essentially three types: (1.) merger or acquisition cases, which are according to priority in the terms of the Federal Aviation Act of 1958; (2.) route proceedings; and (3.) rate proceedings. The overwhelming majority of cases which civic parties have been involved in are route proceedings. Over the last four years that I've been involved in cases before the Board, we have been involved in all three types of cases and to that extent I would like to direct just a few brief remarks to rate proceedings and to merger cases and then get into route proceedings.

In terms of rate proceedings, generally speaking, civic parties do not become involved with rate proceedings before the Board. This is left to the airlines, the Bureau of Economics, and the Bureau of Operating Rights. The Massachusetts Port Authority and several other civic parties have, however, participated in recent rate proceedings. This participation was essentially one of low profile, wherein we urged the Board to approve rates which would assure a sufficient rate of return to airlines so that the industry would remain viable and thereby be able to provide the type of service that is needed in the various markets. Beyond that general participation, the only other case that I can think of of recent vintage that we were involved in was the North Atlantic Air Cargo Rate Investigation, which is still pending before the Board. This case involves the question of Transatlantic Cargo rates. The Massachusetts Port Authority has actively participated in this case, urging that rates be based upon mileage rather than a common rating type approach because Boston is

closer in terms of mileage to most of the European points than other East Coast Gateways.

We at the Massachusetts Port Authority have been actively involved in several merger proceedings over the last several years and I do think it would be appropriate to comment briefly on these. Specifically, the five merger cases that we've been involved in are the Northeast-Northwest merger case, the Northeast-Delta merger case, the American-Western merger case, the Allegheny-Mohawk merger case, and the National-Northwest merger case. I think that for purposes of our discussion we can group these into two areas. On the one hand there is Northeast-Northwest and Northeast-Delta, and on the other hand Allegheny-Mohawk, American-Western, and National-Northwest. In the latter group, we became involved and participated in all three of these cases on a somewhat lower profile than we became involved in Northeast-Delta and Northeast-Northwest. Allegheny, Mohawk, National, Northwest, and American all serve Boston. We became involved in this later group of cases because if these mergers became effective, there would be substantial service benefits accruing to Boston. This would result because of the combination or tacking of the route systems such that Boston would get new or additional one-stop service or first or additional single carrier authority. We became involved and we participated by way of statements of position to the Board. Now the Northeast-Northwest and Northeast-Delta cases were quite a bit different. Northeast is the only trunkline carrier with Boston as its home

base. It leases a substantial amount of space at Logan International Airport and has a large labor pool in the Greater Boston area. Northeast has for years been in serious financial condition. While there are a lot of arguments as to what precipitated this, I think a great deal of it can be traced to its route structure, which is essentially a seasonal type of route. It has New England-Bahamas, New England-Florida, and more recently, New England-Bermuda authority. When the Northeast-Northwest merger case came before the Board, the Massachusetts Port Authority actively participated and, I think, aggressively participated and filed extensive exhibits and spent a great deal of time and money in its participation, urging approval of this merger for essentially two reasons: (1.) because Northeast would be saved financially by the merger, with its route structure preserved and its labor pool preserved to some extent; and (2.) because Northwest would be certificated to serve Boston. Over the last few years, Northeast had cut back employees, service, and even stopped serving a lot of smaller New England communities. It was obvious that it was going right downhill and that it was in need of some type of help. For this reason we urged the approval of the merger. In addition, Northwest is a strong, financially sound carrier and it would provide substantial service benefits to Boston. It wasn't long after the Northeast-Northwest merger case was filed before the Board, however, that the Miami/Los Angeles route of Northeast was brought into sharp focus. The Miami/Los Angeles route was awarded to Northeast Airlines in the Southern Tier Route Investigation, which was a route proceeding

before the Board. One of the issues in the Southern Tier Investigation was which carrier would be authorized to provide non-stop Miami/Los Angeles service. There were several applicants, including Northeast, Delta, and Continental. At the hearing before the Board, the Hearing Examiner recommended awarding this route to Continental Airlines. At the Board level, however, the Board reversed the Hearing Examiner and awarded the route to Northeast Airlines on the basis of a route strengthening argument. This idea of a seasonal nature of Northeast routes is one that was pretty well accepted and it was argued on behalf of Northeast that if they could get this major East/West route, they would be able to make it on their own two feet. During oral argument before the Board, Counsel for Northeast Airlines was asked by one of the members whether or not they had any intention to merge and the Counsel replied that they had merger intentions and they felt that if they could get this route they would be on their way to financial security. The Board bought the argument and four days after the Miami/Los Angeles route certificate became final, the Northeast-Northwest merger case was announced. The Airlines opposing the Northeast-Northwest merger jumped right into the picture arguing that the integrity of the Board's process required the Board to withhold the transfer of the Miami/Los Angeles route to Northwest. At the pre-hearing conference stage it became obvious that one of the issues was going to be the question of whether they were going to transfer the Miami/Los Angeles route to Northwest. Northwest, throughout the course of the case continued to emphasize the fact that the Miami/

1

Los Angeles route was an integral part of what they bargained and negotiated with Northeast for and without this route they were not interested in the merger. In the Authority's participation, we tailored our presentation to urge the transfer of this route to Northwest for reason that we were taking Northwest representation at face value and that without the transfer of this route there would be no merger. Throughout the entire case, Delta was standing in the wings maintaining that they were the most appropriate merger partner for Northeast and that they were ready, willing, and able to merge with Northeast. It came down to the wire and the Board approved the merger, but withheld transfer of the Miami/Los Angeles route. Northwest held true to its word and walked away from the merger, so it fell through. Then along came Delta and a merger was negotiated and has been approved by the Board and the President. We also participated in that case extensively.

Q. Who got the line?

A. The route has not been transferred. It has been withheld, but when Delta and Northeast negotiated their merger, it was specifically provided that they would accept the merger without the Miami/Los Angeles route.

Q. Who's flying that route?

A. I don't believe anyone is right now. That route has been withheld and there is going to be a further proceeding before the Board to determine which carrier is going to be certificated in this market. Throughout the case, Delta pushed for the route and argued that they should get it even on an interim

basis, pending subsequent hearings before the Board. But, the merger has been approved and Delta is going through with it.

In terms of Boston, I think we benefited greatly because we not only got Northwest by way of another case, but we also got Delta and Delta and Northwest are probably two of the strongest financially sound airlines going, plus they serve major areas of the country, wherein Boston previously had serious service deficiencies. Delta is in Boston by way of this case and Northwest is into Boston by way of the Twin Cities-Milwaukee Long Haul Investigation.

This case brings up another matter that I just want to briefly touch on because it has to do with an exception to participation by civic parties in cases before the Board. Generally speaking, civic parties are in route proceedings before the Board, argue only the need for new and/or additional service. The Board is not interested in having a civic party come in and push a particular carrier. That is left up to the airlines. The Twin Cities-Milwaukee Long Haul Investigation was an exception as far as Boston was concerned. At issue in this case, among other things, was the question as to whether or not the Board was going to authorize non-stop service between Boston-Milwaukee and between Boston-Twin Cities. The Authority's participation in this case, which was once again quite extensive, urged two things: (1.) that there should be such non-stop service in these markets; and (2.) that Northwest Airlines, as the carrier in this market, thereby deviating from the Board's philosophy that

civic parties stay out of the area of carrier selection, can all be traced to the famous or infamous Trans-Pacific Route Investigation. Back in 1961, the first Trans-Pacific route case took place. At that time, a hearing was held and substantial findings were made by the Hearing Examiner. Boston was, in effect, awarded its first direct access to Japan and the Orient. In any route awards that involve service to foreign points, the President must approve the award and the President, in this first Trans-Pacific route case, disapproved with minor exceptions, the entire international phase decision in that case for foreign policy reasons. Then, along in the late 1960's comes the second Trans-Pacific Route Investigation. It was probably the largest route proceeding in terms of numbers of parties, hearings, poundage of exhibits filed with the Board, and whatever other standard you wish to use. After the hearing, Boston was recommended for its first direct service to points in the Pacific on Northwest's System, including Japan, Korea, Okinawa, Taiwan, Hong Kong, and the Philippines. Boston was recommended for its first direct service to the South Pacific, American Samoa, Australia, the Fiji Islands, etc. on Eastern Airlines. This was the high point as far as Boston was concerned in this case. The Board deleted Northwest at Boston on the theory that Northwest did not currently serve Boston and it would be a financial burden to establish a station there.

Q. How can the Board make such a decision when truly Northwest has such reasonable management and ought to know what it's doing? The Board seems to be acting as a kind of parent.

A. Well, the Board has the statutory authority to determine such issues. Their statutory mandates are to promote, develop, encourage Civil Aeronautics and they have control over the rates and over the routes. The parties come before them in an adversary process to try to put forth their positions and, of course, there is the necessary self-interest contained in all of these positions. The balanced system envisioned by the Federal Aviation Act is theoretically based upon the Board's independent decisions in such instances.

Q. Are they in fact saying that the Northwest management is incompetent?

A. No, I don't think they were saying that. I just think that they consider that Northwest, like all other carriers, are anxious and aggressive in seeking to get new routes and that there are considerations that transcend the basic route strengthening desires of the airlines.

The Board also changed the award to Eastern and gave it to Continental and Boston once again lost out because Continental doesn't serve Boston. So, for reasons completely unrelated to what we felt was an assessment of the service needs of the Boston area, Boston had lost these two route awards. When the award was made to Continental and was approved by President Johnson, it was just before the end of President Johnson's term in office. There is a 21 day period to file petitions for reconsideration with the Board and of course these 21 days overlapped the change of administration. President Nixon reopened the entire South Pacific and Central Pacific phases of the case,

so it started all over again with briefs and arguments before the Board. Boston did not make out any better during these subsequent phases, however. This gives you the background reason that Boston supported a particular carrier (Northwest) in the Twin Cities-Milwaukee Long Haul Investigation. What Boston lost in the Trans Pacific case would be regained in large measure if Northwest came into Boston on the Twin Cities case, because it would open up to Boston the entire Pacific system of Northwest.

Another area that civic parties can get involved in is bilateral treaties. Before a carrier can serve a foreign point it must have authorization by way of a bilateral treaty with a foreign nation. Once such a treaty is approved, there is a proceeding before the Board to determine what specific carrier flies that route. The Authority has become involved in this in a couple of instances and the one that seems to come most significantly to mind is the Boston-Toronto market. This is a major market in terms of Boston O & D passengers and yet there is no non-stop service in this market. We took the initiative back in 1969 when there were scheduled U.S. -Canadian Bilateral Treaty Negotiations coming up. The two arms of the government which are involved in this are the Bureau of International Affairs of the Board, which is one of the five bureaus that I mentioned before, and the Department of State, the Division of Aviation. What the Authority did as a civic party was to file an application with the Department of State and the Civil Aeronautics Board documenting the need for service on a non-stop basis in the Boston-Toronto market. We submitted direct

exhibits similar to what we were doing in regular route proceedings before the Board. After the Bureau of International Affairs and the Department of State receive all this data and their own input from their own staffs, they review these and make their own analysis and draw up a list of markets which they seek authorization for when the treaty is negotiated. The Authority filed its application in March or April of 1969. Treaty negotiations have been one of these on again-off again type of things. They convene and then recess and reconvene and I think they are scheduled to reconvene once again in August. We don't care if the carrier authorized is a U.S. or Canadian carrier. We are only looking for the service and if Boston-Toronto is included in this treaty for non-stop service, then there will be a proceeding before the Board solely to determine what carrier should fly this route. We would, by way of token representative, participate in that because of our participation at this level and once again we would not care which carrier flies the route. Route proceedings are the next area I would like to discuss. Any carrier wishing to fly interstate scheduled air service, unless it's an air taxi, needs a certificate of public convenience and necessity from the Civil Aeronautics Board, in accordance with the Federal Aviation Act of 1958, as amended. There are guidelines which have been put forth by the Board and which are used by civic parties, as well as airlines, in terms of deciding when and how to argue the need or lack of need for non-stop or any other type of service in a particular market. The guidelines essentially are 50 O & D passengers per day in any

1

market and the Board will consider the need for non-stop service. With 100 O & D passengers per day in any market the Board will consider the need for competitive non-stop service in the market. Both of these standards arose by way of Board decisions and while the Board says these really aren't standards but only general guidelines, they are nevertheless what is used by parties before the Board in urging various types of service. O & D passengers, a statistic I've mentioned several times, are origin and destination passengers. In it's simplest terms, if I were to fly from Boston to Washington and back again in one day, then I would appear as two Boston-Washington O & D passengers. Boston is in somewhat of an anomalous position in terms of origin/destination passengers because of the proximity of New York and the air shuttle service. We continually argue to the Board why Boston's O & D traffic in any particular market is substantially understated to the extent that many Boston passengers will utilize the shuttle service to New York and then take the service out of New York. For example, if I'm going to Chicago and I go to New York on the shuttle and then catch a New York-Chicago flight, I appear in terms of O & D traffic only as a Boston-New York passenger, and I appear in terms of the Chicago market as a New York-Chicago passenger, so Boston, in a sense, does not get credit for that Boston-Chicago passenger in the O & D traffic surveys. I'm not sure whether this is an advantage or disadvantage because we take a position in case after case that Boston's O & D traffic is understated because of the number of people using the shuttle service. In terms of deciding

when to participate in any particular case, and the type of service that we're seeking, Boston, as do most major civic parties employs economic or airport consultants. Boston has for some time utilized the firm of Landrum & Brown of Cincinnati, Ohio. They have prepared for Boston, back in 1965, a Boston Master Air Service Plan, which is an analysis of most of the domestic market in the United States in terms of the levels of service in 1965, the projected levels of service in subsequent years down the line, what is anticipated, what we should have, what we want to have, and so forth. This Plan has been updated on at least one occasion. This Master Air Service Plan is not always the determining factor as to whether or not we jump into a particular case, but it is a guideline. However, in many cases, especially the more important ones and more significant ones, we have utilized Landrum & Brown to prepare our direct exhibits.

Sometimes the mere inception of a case is sufficient to get the desired service results from a particular carrier. An example is the Boston-Bermuda Service Investigation, which was going on back in 1968. In this case at issue was whether or not a second carrier should be certified to provide non-stop service in the Boston-Bermuda market. At the time, only Pan American provided service in this market. The overwhelming number of Boston passengers in this market were either honeymooners or vacationers going to Bermuda. In terms of flights, Pan American had one a day, which left at something like 4:15 in the afternoon. This was inconvenient because passengers going down

there would waste a day. They would arrive down in Bermuda at 6:30 p.m. or so and by the time they got to the hotel or wherever they were going, it would be too late to really do much of anything. Pan American wasn't overly interested in these considerations, for the simple reason that they were the only carrier in the market and they felt that if you wanted to go to Bermuda, you were going to take they're 4:15 p.m. flight. All of a sudden, once the case started, and with no major announcement, Pan American started flying two flights a day, adding an early morning flight. Their somewhat belated efforts didn't pay off, however. A second carrier was certified to provide non-stop service in the market.

Route proceedings frequently start with an application to the Board by a carrier for additional service rights or for the removal or restriction on one of their routes so as to provide new and/or improved service in a particular market or markets. This route application can sit with the Board for what seems like years. Whatever criticism is leveled at the Civil Aeronautics Board, and there is some from time to time, I can assure you that it is entirely unfounded to the extent that it says that the Board acts irrationally or without sufficient time to consider the issues. Often, an application of this type is accompanied by a Motion for Expedited Consideration. This is acted upon by the Board with somewhat more dispatch and oftentimes civic parties will jump into the case by way of an Answer to Motion for Expedited Consideration. The case that comes to mind, as far as Boston goes, was an application

1 filed by Pan American about a year and a half ago, to remove certain restrictions from their Latin American route certificate which would provide improved service in certain Latin American markets for Boston area passengers. Pan American accompanied the application with a Motion for Expedited Consideration. There is a provision that any interested party can answer such a Motion in seven days. The Authority filed an Answer supporting the Motion on the basis that there would be improved service if this relief were granted. The Board granted the Motion for Expedited Consideration, but in so doing they reduced certain points or eliminated certain points from being at issue in the proceedings and in effect, eliminated from the entire proceeding the service benefits as far as Boston goes. The Authority's participation in the case concluded therefore.

Once the Board sets down a case in terms of the civic parties situation, there are three possible sets of circumstances: (1.) The civic party is specifically made a party at this stage. There is nothing further to do at that point until the pre-hearing conference; (2.) Boston, for example, would be mentioned as one of the city pairs at issue in terms of new authority, but the Massachusetts Port Authority is not made a party to the proceedings. We have to file a petition for leave to intervene, which is in effect a request that the Board permit the Authority to become a party in the case; and (3.) The route proceedings set down for investigation do not name your city as the city pair point, but it is pretty close and it is arguable that relief could be granted

in that type of investigation. The civic party will then file a petition for leave to intervene and a motion to expand or modify the issues to bring that particular city into issue in the proceedings. The next step in the process is the pre-hearing conference. To my knowledge the Civil Aeronautics Board was the first administrative agency to make use of this proceeding and I know that there is a similar procedure now in the Federal Courts for a pre-trial conference. This is a very useful vehicle. In essence it's an informal hearing, so to speak, before the hearing examiner. The hearing examiner sits as judge, so to speak, in these cases. When the case is set down for investigation, it is assigned to one of the hearing examiners and he stays with it for the entire case. Prior to the pre-hearing conference, the Bureau of Operating Rights sends out to all the parties a document which lists what the Bureau feels are the issues. They also list what they feel are appropriate information requests. These are requests for information from the various parties, be they airline applicants or civic parties. Any party has a right to comment on this submittal by the Bureau or submit their own suggested issues or their own recommended procedural dates or their own requests for evidence. When the parties sit down before the hearing examiner at the pre-hearing conference in Washington, the hearing examiner usually uses the submittal of the Bureau of Operating Rights as a guideline, goes through it, the parties argue about it, and the Examiner decides what the issues are going to be. The issues really establish the outside guideline of the case. If what you seek introduced in evi-

1

I dence is not relevant to the issues in the case, it will be excluded. If you want to put forth some position, therefore, you have got to make sure that it is covered by the issues in the case. It is my impression that a great number of civic parties do not make sufficient use of the pre-hearing conference. For example, there are oftentimes boiler plate requests for evidence for specific areas, which in many cases don't apply to the larger cities. They want to know the capacity of the airports, etc. Oftentimes civil parties waste money, time, and effort in furnishing information that no one really needs.

Following the pre-hearing conference is the report of the pre-hearing conference. This is the decision by the hearing examiner with regard to the issues, the requests for evidence, and the procedural dates.

Next comes the exchange of information responses. Once again these are requests that parties are required to comply with supplying information. It is a very useful vehicle for civic parties. If you are interested in getting some data from an airline, specific or otherwise, you seek the hearing examiner to include this in the pre-hearing conference report and if he does, then the airline has to provide you with the data. Often this is very helpful in terms of putting together your presentation.

After the exchange of information responses comes the dates of direct exhibits. This is really the crux of the case as far as civic parties are concerned. Whatever argument you want to make in terms of service needs

has to be based upon the evidence submitted at the hearing. If you want to argue the need for service in a particular market, you've got to make sure that you get into your direct exhibits sufficient data to back up the needs of this service.

Following the exchange of direct exhibits comes a date for rebuttal exhibits. This is an opportunity to rebut by direct exhibits so to speak, any particular exhibit or exhibits of parties. This exhibit must specifically rebut another party's exhibit and you have to specifically mention what exhibit you are rebutting.

Next comes the hearing, which differs in some respects from a trial in that there is no direct testimony. What you do is you bring to the hearing the individual or individuals who prepared your direct exhibits. He gets on the witness stand and testifies as to who he is and what his background is and that he prepared these direct exhibits either directly or that they were prepared under his supervision and that they are true and correct to the best of his belief. Then the witness is made available for cross examination. Essentially, the hearing is comprised of cross examination of witnesses with regard to their direct exhibits. There is a provision in the rules of practice before the Board for accepting into evidence a party's direct exhibits without the need of a sponsoring witness, but to do this, you must file an affidavit at the time of the exchange of direct exhibits, setting forth the fact that the direct exhibits were prepared under the witnesses' direction and are true and correct

to the best of his belief. Also, a formal request that the direct exhibits be accepted into evidence without the witness being at the hearing must be made. This, of course, serves several uses or functions. On a pragmatic basis, it saves you the expense of bringing the witness to Washington. In a theoretical sense, it saves you potential embarrassment in having any weaknesses in your direct exhibits pointed out. If any party objects to such a procedure, all they have to do is file a notice and you have to bring the witness to the hearing. Following the hearing, the hearing examiner sets a date for briefs. This is where you make your substantive argument. This is where you argue the need for service based upon your direct exhibits and other evidence in the record. After the briefs are submitted, the hearing examiner comes down with a recommended decision or an initial decision and then the parties have a period of time in which to file exceptions or objections to this decision. Following the exceptions, the parties file briefs to the Board and then oral argument is scheduled before the Board. Following this oral argument, the Board makes its decision.

I have just three or four more brief points before I close and I will be available for any questions. One of them is that there is a provision in the rules of practice before the Board, for what is known as Rule 14 Participation. Any party can participate under Rule 14 by merely showing up at the hearing and presenting a statement of position. That is the extent of your participation, however. You have no right to participate in the hearing, to file a

brief to the examiner, no right to participate in oral argument. Many civic parties do use procedure just because they employ Washington counsel and find that it is too expensive to participate all the way down the line and they just want to get into the record, so to speak, with their statement of position.

There is also a show cause order which is a relatively new procedure before the Board which permits an airline to file an application for a show cause order, whereby the Board would send out an order directed to any interested parties requesting that they show cause why a route restriction should not be lifted. An example of this is Allegheny Airlines following the consummation of their merger with Mohawk, has filed an application with the Board for a show cause order, seeking to consolidate thirty-three individual segments on their Route 97 into one combined segment. The effect of this as far as Boston is concerned is that it would provide new non-stop service between Boston-Louisville, Boston-Toledo, and substantial new one-stop service. This filing by Allegheny was accompanied by a motion for expedited consideration. We are filing tomorrow an answer in support of both the motion for expedited consideration and the issuance of the show cause order. This is a useful procedure and can sometimes be accomplished so that relief can be granted without the need for a hearing; provided no one strenuously objects.

The last point I want to touch upon before closing is what can you do in terms of service improvement for a civic party. I think, first and most obvious is to go to the airline certificated to provide the service you're interested

in. You might want more service in the Boston-Dallas market. You find that one carrier is authorized to provide this service and you go to that carrier and try to convince it to provide the necessary service. This is not frequently very successful. Larger communities have somewhat of a better chance because they have a little bit more bargaining strength with the carriers who want new space, more space, new terminals, etc. The other two alternatives are for a city to file a petition for the Board to establish a route investigation for that particular geographic area. The only one I know of is Albuquerque. They filed an application which became the Service to Albuquerque case. Beyond this the only thing a city can do is to urge an airline, if the airline is not authorized, to provide service in a particular market, to file an application. One point in this regard is that civic parties have to be very careful in their participation in route proceedings. They cannot jump on any particular airlines band wagon. Any time there is a route proceeding pending, the airlines come knocking at your door and they have in their little briefcases, your petition for leave to intervene, your information responses, your direct exhibits, your briefs to the Board, and even your oral argument. They tell you all the wonderful things they are going to do and they have schedules printed showing how they are going to fly 16 flights out of the city. Any civic party that is seriously interested in participating in proceedings before the Board has to establish some sort of integrity of approach that you're an independent party and that you are only representing your own interest. I can remember attending a seminar out in

Minneapolis, Minnesota two or three years ago, at which time the now Chief Hearing Examiner, Mr. Ralph Wiser of the Board, spoke to the participants regarding one of the very first cases he had with the Board. A civic party filed a petition for leave to intervene and in the petition there were blanks where the city was to have filled in its name. The city, however, overlooked this and filed their petition with parentheses saying (fill in the name of your city). This is something that civic parties have to be careful of in participating in route proceedings.

N73-32881

THE ECONOMICS OF AIR CARGO

and

AIR CARGO MARKETING DEVELOPMENT

Massachusetts Institute of Technology/NASA Workshop

Waterville Valley, New Hampshire

Presented By: John W. Kersey
Division Vice President
Cargo Sales & Services
Eastern Air Lines, Inc.

Dates: July 17, 1972
July 18, 1972

THE ECONOMICS OF AIR CARGO

Air Cargo has been in existence on scheduled carriers on a regular basis for about 28 years - Mail and Express for a much longer period. It's interesting to note that the scheduled airlines of the United States came into being not to carry passengers but to carry mail and later express for American Express, the predecessor of the present REA. Our basic route awards were in fact authorized with the basic requirement that the mail be carried. To this day, mail has priority of accommodation over all other classes of traffic.

In discussing the economics of Air Cargo from the carrier point of view, the first premise is that the combination carriers (that is, those who carry both cargo and mail) really do not know precisely the costs associated with providing a viable cargo service; thus, the debate rages as to the profitability of cargo -- the result, an unwillingness to make commitments to the cargo business as freely as they are made to passenger development.

In spite of the airlines' origins in cargo, as the airline industry evolved, the advantages to the traveler of speed of air became more quickly apparent than to the shipping public, and the logistics of providing service to passengers seemed to be far less complicated than development of a cargo system. A simple example would be that there already were the private car and public ground transportation available to the passenger so that, generally, ways of moving people to and from airports were already established.

On the cargo side, there was no ground transportation available to shippers because the volume of business available when air freight was established would not justify the operation of regular trucking services between the airports and shippers and receivers. Thus, ground transport for cargo was

a logistical hurdle that did not exist, essentially, for the developing passenger market.

Then, too, the passenger market was and is more flexible than the cargo market in terms of availability for carriage. By that, I mean that passengers have varying needs for time of departure and arrival, so that much of a day can be covered with schedules with some assurance that there will be a demand for those schedules, thus providing utilization opportunities for passenger aircraft that have not, until recently, been recognized for cargo. And I parenthetically state that utilization becomes an increasingly dominant economic factor as the aircraft get larger and more expensive.

In air cargo, unfortunately, the shipping public historically has had a pattern of production and order processing that takes place during the business hours, Monday through Friday. Most of their traffic is not available until late each day and their daily shipments are greater in the latter part of each week. Also, there is very little originating traffic available during the weekends.

The end result is a series of peaks and valleys that provide a very difficult logistics problem which has two parts - schedules and manning.

Also, the airline costs and, hence, degree of profitability have been difficult to determine, especially for carriers who transport both passengers and freight.

The economic studies that have been undertaken, have snagged on the problem of allocation of costs as between passenger and cargo operations, which does, in fact, defy easy analysis -- example:

Allocation of costs of crew, manpower, cost and amortization of

aircraft, direct operating cost, i.e., gas and oil on an L-1011 carrying 26,000 pounds of cargo with a full passenger load.

Also, since passenger revenues had so dominated in terms of contribution to total carrier revenues, particularly domestic carriers, a major portion of management time and corporate resources were dedicated to the passenger side, with cargo treated as a by-product.

Incidentally, in international air transport, one major foreign flag carrier derives about 35% of its total revenue from cargo.

Now let's look at the current situation. Managements are becoming increasingly aware of the air cargo product and are asking questions about the economics of carrying cargo for a number of reasons, which include:

- The annual dollar volume of air cargo is more than one hundred million dollars for several airlines, and is fast approaching that volume for others.
- The rate of growth of cargo is substantially larger than passengers and the percentage of cargo to total revenue within the airlines is becoming larger each year.
- With the introduction of wide-body aircraft, which have between 225 and 350 seats, management is looking for revenue which will decrease the passenger breakeven load factor. Air cargo is now looked at as a large potential contributor to reducing the passenger breakeven load factor.

- Last year's recession and large losses of the airlines made managements search for all sources of business which contribute to covering airline costs. On some route segments, the full use of the available cargo space can reduce the breakeven load factor by 10 percentage points.

Our most recent studies, done with the help of an outside consulting firm, uncovered the following:

1. Basically, at least one half of total costs are in ground handling; productivity per employee is low, and our ground handling is inefficient. Looking into the reasons for this, we found that we have severe peaks and valleys at freight terminals which are more difficult to control than for motor carriers. For example, the majority of motor carrier vehicles are owned by the motor carrier so it can control its flow into and out of the terminal, thus maintaining a stable flow of traffic. In the trucking industry, there is a standard of pounds handled per man hour of about 3,500 pounds. The airline industry is lucky to get 350 pounds -- 1/10th as much. We in the airline industry do not own our own pick up and delivery trucks and, thus, vehicles arrive and depart our terminals on schedules reflecting historic shipping patterns of our users which is afternoon pick up for evening delivery to the airports -- night time

and early morning arrivals for a.m. delivery. We are testing a system of RDT in New York City to reduce peaking.

The RDT system, meaning "Reserved Dock Time", is a simple system whereby we reserve space at a dock for regular shippers of air freight -- including forwarders.

We have found this system produces less congestion and more balance of traffic arrivals and departures. More than anything else though, it is the pattern of shipping on the part of our users that imposes the peaking that is so costly to the airlines. This is compounded by the type of labor contracts in existence, which call for eight hours pay, once an employee reports for a shift.

2. We found that there are a substantial number of ways in which to allocate our costs for line flights, paperwork, management, etc. We also found that it was impossible to get complete agreement for one method of allocation.
3. We found that in certain areas where there were much higher costs than anticipated, the responsible department producing these costs were overly critical of the study methods used to determine costs and fought the principles of the study -- rather than analyzing the problems and taking actions to lower their costs.
4. We found that after the consultant left, there was improper update.

Very few actions were taken on the initial cost study performed. Not until the end of last year did we embark on another cargo cost study which, I am happy to state, is producing good results, including the preliminary estimate that cargo is profitable.

Because of the problem encountered in the last cost study, we took the following actions:

1. The new study was performed inhouse, with a small degree of outside consulting.
2. The study was presented to corporate management, rather than department heads.
3. Corporate management agreed that cargo on line flights produces relatively little incremental cost.
4. The effect of allocated charges for overhead and administration was minimized. We did not try to zero in to the nearest percent, the time a person spends in cargo activities.

Some of the conclusions of the study were:

1. That cargo is more profitable on passenger flights than on freighters. (Parenthetically, again -- the ideal all-cargo aircraft is still on the drawing boards)
2. That cargo is more profitable when it is moving to longer haul market, rather than shorter haul.
3. That cargo is more profitable when we receive unitized shipments, rather than non-unitized shipments.
4. That cargo is more profitable when we receive higher weight shipments rather than lower weight shipments.

One of the most important points was that cargo, in total, is potentially profitable on passenger flights. Of course, this raises the question, "is cargo profitable on freighters?" Airline information forwarded to the C.A.B. shows that freighters are unprofitable on a fully allocated cost basis, and that a high breakeven load factor must be achieved before cargo becomes profitable. But, the most important point, as far as economic is concerned, is that freighters, marketed properly, generate traffic for the total fleet. As a simple example, there are freighter segments, New York to New Orleans/Houston, where on most days, the amount of cargo brought out for freighters exceeds demand. Thus, the traffic which cannot be boarded on freighters because of weight or space limitations, is "forced" on to passenger flights. Also, the New York shippers who bring traffic out to the New Orleans/Houston freighter do not like to make a large amount of costly stops at various airlines, and thus tender the freighter operator traffic for the many destinations the carrier serves. Therefore, on a direct cost basis, the New York to New Orleans/Houston freighter may not produce a profit; but, the generative effect of the freighter producing traffic for combination flights over the same segment, as well as many other segments, yields a substantial amount of incremental revenue to other flights.

Whether the airlines make money or not is not the key questions of the economics of air cargo. The primary question within the airlines is how do we make cargo more profitable than it is today, and in this way make cargo more economical to the shipper and more competitive with surface modes of transportation.

Tomorrow, when I speak of Air Cargo Marketing Development, I will present some new marketing ideas which we have developed that make cargo more economic for the airlines as well as shippers. But today, let's just look at the areas of reducing the costs of the carriers and making air cargo more economic.

As we look at the economics of cargo within an airline, we will deal with four principal areas, including:

1. Paperwork costs
2. Terminal costs
3. Line haul costs
4. Claims cost

In each of these areas, the air carrier can make major improvements.

Paperwork

The cost of paperwork is very high within the airline industry, as well as the entire transportation industry. Consider that when we pick up a shipment, a bill with eight copies is completed. When the packages get to our terminal, lot labels are placed on the shipment if it contains more than one piece. Reserved space or other types of labels are also placed on the shipment in many cases. Special labels showing date of shipment, color coded by day of week, are also placed on packages. Paperwork is completed at transfer stations and at destination stations and documents must be signed when shipment is delivered. But, this does not end the paperwork, because we now get into accounting procedure. We must bill a shipper, in some cases several times; collect his money; send an audit bill through accounting to make sure the proper rate was placed on the shipment and, finally, close out the account for

a particular shipment.

All of this paperwork is expensive and the basic costs do not materially change whether the shipment weighs one pound or 10,000 pounds. This is why we have a high cost for minimum charge shipment. We must establish more simple procedures within the airline industry for paperwork. This is the key way to reducing costs. United Parcel Service has an excellent low cost paperwork system. I believe that the airlines must analyze their procedures and others with efficient warehouse or terminal operations and implement a simpler paperwork system such as that used by UPS. If we do not do this, the paperwork for handling shipments will grow greater each year, especially because people make out the paperwork and the cost of labor keeps increasing every year.

There is advanced technology which is partly on-line now and will be implemented more fully by late 1973 or early 1974 that should provide lowered handling and administrative costs as well as better customer service. Essentially, it is a highly sophisticated communications system tied to data processing, which will provide instant routing and tracing information as well as automatic rating and billing, thus considerably reducing paperwork and attendant costs.

Terminal Costs

The more lighter weight packages that an airline handles, the higher the costs we incur. It takes time to handle each package and we must expedite the answer to reducing labor cost within our terminals through greater containerization or some other form of unitization. Consider an example ---

a truck pulls up to our dock with 100 pieces. We must off-load these 100 pieces. Thus, we have 100 handlings. Later, we place these 100 pieces on a cart. The cart goes to an airplane and we place the 100 pieces on the aircraft. Therefore, at the originating station, we have 300 handlings. Hopefully, the shipment will not transfer at another station where we would have another few hundred handlings. If the freight goes directly to the destination station, we have 100 handlings off-loading to a cart, another 100 staging pieces on a pallet, since we must empty the carts, and then another 100 to place the pieces on to a truck. Thus, from origin to destination, without any transfer, we have 600 handlings.

Consider the shipper who uses one container for 100 pieces. We take the container off the truck, place it on an airplane, take it off the airplane and put it on a truck for delivery at destination station. Thus, we have 4 handlings; a reduction of 596. Believe me -- this saves money.

We all too often look at containerization as reducing handlings of shipments from 100 to 1 piece, but what we are really doing with containers is reducing the handlings from 100 to 1 during many handling steps. Containerization and other forms of unitization, such as palletization, is now growing rapidly, especially because of the initiation of reduced rates for shippers who tender unit loads to the carriers.

While we are speaking of the area of terminal cost, I would like to state that the most grossly unfair practice of all transportation companies is to increase their rates on an across-the-board basis. Rates are primarily raised to pass on increased costs of doing business; mostly, these days, effect of inflation and labor costs.

There are some shippers who tender traffic to the airlines that is highly unprofitable and other shippers who tender traffic to the airlines that produces large profits. Should we increase, by 5%, the cost to shippers who tender undesirable traffic to us, and also increase the cost by 5% to shippers who give us profitable shipments?

We have been studying a new concept in rate-making which is based on the following:

1. For shippers who tender us tonnage with characteristics of two pieces per cwt., we will establish a basic rate.
2. For shippers who tender us traffic with more than two pieces per cwt., each piece over two pieces per cwt. would incur an extra charge of \$1 surcharge.

If a shipper tenders us ten pieces for a 500 pound shipment, he will incur the basic cost. If a shipment tenders 15 pieces for a 500 pound shipment, he will incur a surcharge of \$5 additional cost.

Thus, the shippers who tender us traffic and incur a surcharge will be paying for the extra handling cost. But most important, he will have an option of not paying this surcharge by consolidating his pieces through containerization, strapping, palletizing, etc., to reduce his piece count. I think this makes sense since this proposal penalizes shippers who raise the costs to the airlines and allows these shippers, as well, to reduce their costs by tendering the airlines traffic which we can handle more efficiently and thus reduce our cost.

At this point, I know that many of you would state that we should just not deal with the characteristic of number of packages but should also concentrate

on density. Generally, we cube out our aircraft capacity before we reach maximum weight. It is important to note that we have a density rule in the tariff that penalizes shippers who tender less than seven pounds per cubic foot domestically and less than nine pounds per cubic foot traffic internationally.

Line Haul

We find that the key characteristic is density of traffic. The higher the density, the more profitable the traffic. As an example -- we have freighter planes which can carry 39,000 pounds. We find that we bulk out at between 32,000 and 34,000 pounds and, therefore, lose between 5,000 and 7,000 pounds of utilization per flight. The airlines must attract higher density traffic in order to make cargo more profitable.

Claims

I am sure most of you have read about the high cost of claims in the transportation industry. This, of course, is partly because we handle, on the average, higher value shipments than surface, thus increasing exposure. Actions must be taken to reduce these claims. During 1971, Eastern's claims costs were half of what they were during 1970 and during the same time we experienced the highest increase in revenue traffic for any domestic carrier. Two actions we took to reduce claims include:

1. Charging claims to destination station, rather than originating station. This focuses the destination station on proper handling and they communicate with origin stations to make sure the traffic is loaded and handled properly so that when it

arrives at destination station, they are not charged with a claim.

2. We implemented procedures for special handling of high value shipments. We found that by having air freight supervisors and other competent employees watch the loading and unloading of these shipments and follow them to the high value rooms in our terminals, we were able to experience a substantial reduction in cost of claims for these valuable shipments. Claims are a significant part of cost of doing business that can affect both carrier cost and the price charged to the customer.

Today, we are faced with several extraordinary challenges --- getting better utilization from our current aircraft - Eastern alone produces 3 trillion ton miles of belly capacity annually with a utilization of 20%; developing "cargo hour" scheduling; working toward more economical cargo aircraft; achieving better efficiency on the ground.

Tomorrow, in the context of our discussion of Air Cargo Marketing Development, we'll discuss marketing solutions to, particularly, capacity utilization, containerization, and pricing elasticity.

#

N73-32882

AIR CARGO MARKETING DEVELOPMENT

First, let's define marketing as it relates to Air Cargo; better yet, let's define air cargo -- Air Cargo is a service that provides time and place utility to goods - it principally serves the commercial and industrial economies of the world and includes movement of industrial components, manufactured goods, consumer goods and agricultural and horticultural products, almost all of which do not go to the end user. When considering the market development of air cargo in the context of the workshop entirely dedicated to air transport, it is well to keep in mind that passenger service is essentially a consumer product, while cargo is essentially an industrial product. In terms of marketing techniques, then, the passenger product is marketed like other consumer goods such as soap and cereal -- the cargo product should be marketed using industrial marketing techniques similar to business machine and computer manufacturers. In other words, bringing shippers and receivers to the regular use of air, requires an economic justification -- a trade off of higher base costs versus competitive surface forms for which there are overall total distribution cost savings and/or increased sales and profits. Air cargo marketing, just as any other product or service marketing should follow certain patterns.

We feel that marketing should start with a definition of customer wants and needs, which is acquired by research. In a transport industry environment, as opposed to manufacturing industry, this means that the time and place requirements of the prospective user must be first defined and a product created to produce what the market or at least part of the market wants. Unfortunately, for the most part, the cargo product of the airlines has been

essentially a by-product of the passenger product, has not necessarily been designed based on customer want and need. This approach has produced a relative ability to produce speed-in-transit far in excess of anything previously offered in surface transportation - and relative speed of transportation has proven long since to have varying user values. If speed-in-transit were not economically significant, and direct cost dominated selection of transportation mode, then everything moving from New York to San Francisco would still be on the ocean, since ocean freight carries the lowest rate of any transportation mode.

So -- As an industrial product, requiring economic justification for its use, cargo marketing's goal is to demonstrate the profit potential of spending more money on transportation costs but achieving cost offsets or increased sales that end up contributing incremental income to the bottom line of the Profit and Loss Statement.

The most effective way in which to achieve that objective is to analyze or convince prospects to analyze their total physical distribution costs, which can represent as much as 50% of total costs for many industries. Of course, transportation costs are only one of many components of physical distribution because distribution is made up of series of interdependent components. A change in any one has a direct or indirect effect on the whole physical distribution system.

So - marketing starts with a product design based on customer wants and needs and production of that product. It then progresses into a determination of cost of producing the product, taking into consideration the fixed

costs, adding the impact of volume on cost and establishing the cost/volume relationship necessary to produce at least breakeven - hopefully a profit -- more important - a reasonable return on investment. These considerations produce a price which the customers will pay for services rendered.

We now have established what the customer will buy (we could call it product design) through market research, an integral component of marketing; the price to be charged, another function of marketing, aided by financial analyses and, hopefully, the result is a product and price that can be taken to the marketplace with reasonable expectation that sufficient prospects will purchase the product offered - and presenting the product to the marketplace is the primary and most commonly recognized function of Marketing. Most of the marketing techniques used by the Air Cargo Industry are very similar to those used in most industrial marketing activities. That is, marketing tools such as direct sales (unlike many consumer marketers, we feel strongly that the Sales Representative is our most important marketing tool), advertising, sales promotion, direct mail -- Advertising, however, is placed much more in industrial publications such as Iron Age, Purchasing Magazine, Traffic World, etc., rather than consumer magazines, i.e., Life or even general business magazines such as Fortune, Business Week, etc.

We feel that of the three basic ingredients of marketing transportation, the Sales Representative ranks first in importance; direct mail is second because it can be targeted and selective; and media advertising ranks third.

In cargo marketing, there are some unique factors that complicate the execution. One is that almost everybody who grows, breeds or manu-

factures something has to ship it somewhere - without quantifying it, this means that our theoretical total market potential is vast (today, the domestic air industry carries less than 10% of total intercity traffic) and reaching that total market is an enormous challenge. The second is that not all of the potential market is necessarily desirable or profitable to handle. Unlike a producer of goods where almost the only thing that makes a customer undesirable is that he's a poor credit risk, there is a great variation in the profit or loss potential inherent in the infinite variety of goods that are shipped. Thus, we do not want to market our product to a great many customers; we want to handle some products at different price levels than others, based on varying costs and risks to the carriers - examples - very bulky goods, fragility, special handling, and varying values to the users. So we really want to market our product selectively, which is not easy under our obligations as a common carrier. We constantly research our market to determine the relative desirability of prospective accounts and establish marketing goals based on selectivity.

The second problem that is unique is that there is a minimum of two buying influences in each transportation purchase, the buyer (the shipper) and the seller (the consignee). This is further complicated by the fact that in some cases there are third and fourth influences, neither of which are either direct shipper or receiver. A third party influence can be a general traffic office who routes traffic from vendors to facilities scattered nation or worldwide -- or an export cargo agent acting on behalf of the shipper or receiver.

Finding and reaching the correct buying influence, then, is a little more difficult than merely seeking out the Traffic Manager of each account. Many small and medium-sized businesses don't have a Traffic Manager per se. Often the strongest transportation buying influence comes from the purchasing or production departments of the consignee.

When attempting to justify the use of premium priced transportation based on reduction of distribution costs, it is usually necessary to involve the financial management of the prospect -- If it appears that air can contribute to increased sales and profit, then we want to involve the sales management of the prospect.

Historically, air cargo was marketed with emphasis on three areas:

1. Freighters
2. Emergency freight
3. Distribution analysis

Why was the emphasis placed on freighters, rather than line flight equipment -- because we firmly believe the following:

1. It is the best approach to servicing a broad cargo market. It deals solely with cargo and is, at worst, a loss leader. We believe that we must meet the shippers' needs. The freighter, basically, moves at night when the customers' traffic is available. It has the size to carry the weight and dimensions of all or almost all the freight moving to destinations important to the freight customers. Therefore, the freighter meets a marketing need because it meets the customers' needs.

2. Placing the emphasis on freighters means that we are, in fact, in the freight business and a good way to demonstrate it is to promote and advertise our freighters. We've found that the all-cargo capability has a halo effect that generates traffic for our passenger aircraft as well. While much of the marketing thrust emphasizes freighters today, 60% of the total traffic moves on line flights. But, with the introduction of wide-body aircraft, we anticipate that there will be a substantial increase in cargo traffic that will be carried on combination equipment and a basic shift in emphasis is already taking place.

As far as emphasis on emergency traffic is concerned, this is basically what we deal in today. Our rates are two to three times the cost of using surface transportation (although closer to class 100, and over, truck rates than many people think) and for many products, it is not economical to ship air freight on a straight transportation cost basis.

Thus, much emphasis is placed on distribution analysis which isolates total distribution cost, including logistical costs such as transportation, inventory, materials handling, packaging and order processing. When impacting the effect of faster transportation on these costs, it can often result in savings in the other areas of distribution that result in net reductions in overall distribution costs. In other cases, when we deal in distribution analysis, we prove that air freight means a higher market penetration, increased sales and increased profits. But we feel that historically we have

come too close to offering air as a panacea for distribution ills. For years, when advertising the total cost concept, slogans were used such as, "We have a warehouse in the sky", or "Let us eliminate your distribution center and increase your profits".

This was the wrong approach. Let's look at an example -- let's say we are able to convince a shipper to eliminate a warehouse. This would create a tremendous problem for the shipper because when we eliminate the warehouse, what do we do with the inventory? The usual reason for a warehouse is to protect service and sales inventory in a geographical area. Therefore, the approach that should be used is -- 'reduce inventory because when a large portion of inventory is reduced or eliminated, there is no need for a warehouse and its high costs", assuming the service to the customer is not reduced. Again, let me point out that the key to air freight marketing in the total distribution approach should be the reduction of inventory. This, then, generates a reduction of labor force, lower warehousing requirements, etc., and can make air freight more economical with surface freight.

Now let's deal with how we will market air freight in the future. Many people have stated that the wide-body aircraft, in configuration, will reduce the cost of shipping air freight and thus result in decreased rates to shippers. Yesterday, I stated that we probably make more money in combination equipment than on freighters and it is our contention that the wide-body passenger schedules will result in decreased costs to airlines as well as a reduction of rates to shippers.

The following is a marketing thrust that demonstrates the potential of creative pricing.

Recently we filed for approval with the CAB, a unique tariff which became effective on July 9, 1972. This tariff is the forerunner of the new marketing thrust in air freight.

Most airlines have, or will shortly have quantities of wide-bodied aircraft. Let's take a look at what a plane of this type, the Lockheed L-1011, does for air freight in a long distance market of 1,605 miles. Over this length of haul, it can carry 73,000 pounds of passengers, baggage and cargo. With 226 seats on this aircraft, an average weight per passenger of 170 pounds and 35 pounds for baggage, we are left with 26,670 pounds of weight to fill up with cargo if we achieve 100% passenger load factor.

The key point is that we have 1,280 cubic feet available for cargo, with 26,670 pounds of allowable cargo weight with a 100% passenger load factor. This translates to a weight/cubic foot relationship of 22 pounds per cubic foot. For comparison purposes, let me cite the weight/cubic foot relationship for freighter aircraft. The 727 freighter has 4,100 cubic feet and a maximum allowable payload of 39,000 pounds or a 9-1/2 pounds per cubic foot weight space relationship. The 707 has a weight space relationship of 10-1/2 pounds and a DC-8 stretch aircraft has a weight space relationship of 11.2 pounds per cubic foot. Again, the L-1011 relationship of weight and space is 22 pounds per cubic foot. These figures lead to an obvious conclusion -- we must get away from selling weight when we sell containers in 1011 passenger aircraft. What we must do is sell space.

It is interesting to note that the average density of cargo traveling today is about 10 pounds per cubic foot. With 1,280 cubic feet of usable space, the 1011 would handle only 12,800 pounds which is less than half of the allowable weight of lift for cargo with a 100% load factor. Thus, the marketing thrust must be toward products of high density and high volume in regular movements. The airlines have an opportunity to attract products and customers who do not utilize air freight on a regular basis at the present time. But, we must present them with an economic cost. Let's look at the New York/San Juan market again. The present tariffs for the container units of 160 cubic feet over this segment state that we will allow the shipper to load 1,120 pounds for \$148.50; a cost to the shipper of 13¢ a pound. With the present average density of air freight of 10 pounds per cubic foot, a shipper could load a maximum of 1,600 pounds in one of these containers.

Eastern's new tariff, effective July 9, permits a shipper to place 3,000 pounds in a 160 cubic foot container for \$198.40. While this is an increase of \$51.90 in the price of the container to the shipper, or somewhere in the order of 35%, he is able to obtain an increase in weight of almost 200%.

Thus, the airline achieves an increase of price in unit while the price to the shipper of dense traffic can achieve a level of 6.6¢ per pound, instead of 13¢; a reduction of approximately 50% over the price paid by the shipper of average density freight.

Also, a new container has been developed for this aircraft which is 242 cubic feet and allows a shipper to place 6,000 pounds in the container for \$300 -- this brings the cost down as low as 5¢ a pound.

These rates are competitive with surface and these are the types of rates that wide-body aircraft will generate for shippers.

Too often in the airline industry, we concentrate our marketing development on the airplane and thus don't expand our thinking beyond the air terminals. The shipper is not interested in flying his traffic from the San Juan International Airport to Kennedy. He is interested in moving the traffic from his plant in San Juan to his customer in New York. Our industry is now recognizing the total user need by doing the following:

1. Publishing door-to-door rates.
2. Establishing container rates with decreases for both pick up and delivery.
3. Working with truckers to stuff and unstuff containers when shippers do not have facilities to handle containers for distribution centers and plants.

Thus, we are coming closer to the service of meeting total requirements of the shipper.

There are other features of product design that have been stimulated by sales needs and marketing research -- shipper needs. As I stated, we are working with truckers to establish door-to-door service and door-to-door rates for customers. The shippers may book their freight on most airlines-- just as a passenger seat is booked. We have telephone centers to provide information to shipper to answer any questions they may have. We are adapting our ground equipment to shippers' needs. As an example -- rates are published for a multitude of types of containers with varying weight limits.

If a shipper only has 200 pounds of traffic to forward to a destination, we provide incentive rates for small containers. There are rate incentives for 500 pounds, 1,000 pounds, 1,500 pounds, 2,000 pounds, and 3,000 pounds or more. Most important, we are adapting our containers to meet specific requirements of shippers, such as, insulated units for shipment of frozen perishable products, including meats, poultry and fish, with compatible transport equipment provided for container movement off-premise.

The majority of freight is handled by combination (passenger/cargo) airlines. Most combination airlines, while having cargo salesmen who devote 100% of their time to selling the cargo product, also insist that what we call "combination sales representatives" sell cargo in areas where cargo salesmen are not domiciled. The combination salesman is supposed to sell both passenger and cargo, but almost always, we find that the combination salesman representing domestic carriers, pays less attention to cargo for several reasons, i.e.--it is more technical; they are usually hired primarily as passenger personnel and remain so oriented; and, very important, for most carriers, cargo represents less than 10% of total revenue. Numerous attempts have been made to educate combination sales reps in technical areas and the industrial sales techniques inherent in presenting the cargo product. Most of these efforts have proven to be of little value.

It is our contention that in order to be dynamic and to universally sell the cargo product of a combination airline, we must have cargo sales specialists. This has been proven historically. But, there is no need to have cargo salesmen in every city we serve. Cargo salesmen must work

not a city nor a metropolitan area, but a regional area because inevitably, in the transportation business, we have hubs with large peripheral areas. Consider Atlanta, like Chicago, a major transportation hub. Only 25% of the originating traffic handled in Atlanta originates in the Atlanta metropolitan area, while the remaining 75% is trucked in to this giant hub from the Carolinas, Tennessee, Alabama, Mississippi, northern Florida, eastern and southern Georgia. Atlanta cargo salesmen should not only cover Atlanta, they should cover the entire geographical area. These are the people that concentrate their efforts on cargo and are the most successful in selling our product.

Gentlemen, a new era in air cargo is being initiated. I am sure that I have not over-estimated the potential of wide-body aircraft making a breakthrough for cargo. It allows us to compete with surface carriers for the first time in air cargo history and next year at this time, I do hope that we can meet at another session and that I can show you the successful results of the airline industry in marketing this new revolutionary product.

#

1473-32883

MIT - NASA SUMMER WORKSHOP
ON
AIR TRANSPORTATION SYSTEM ANALYSIS AND ECONOMICS

REMARKS OF ALFRED R. STOUT
DEPUTY DIRECTOR, BUREAU OF ECONOMICS
CIVIL AERONAUTICS BOARD
JULY 18, 1972

CURRENT PROBLEMS AND ISSUES
IN AIRFREIGHT RATES

The past four years have been very active for the Civil Aeronautics Board in the regulation of domestic passenger fares and airfreight rates. There have been numerous tariff filings by most of the domestic air carriers aimed at making basic changes in domestic fares and rates. These changes involved general, across-the-board increases, selective increases and decreases in particular markets, or for given services or types of products, and finally, fundamental modifications of both the fare and rate structures. These filings, many of them made in the context of a generally depressed airline economic situation, were intended to attract new traffic, to improve the cost-revenue equation with respect to given services or traffic, and in the end, to improve the filing carrier's "bottom line."

The CAB reviewed each such tariff within a short period of its filing, permitted some filings to become effective but suspended others pending investigation. This evolutionary process has already resulted in quite significant fare and rate changes in terms of both level and structure. For example, the domestic passenger fare structure has become much more "tapered" than previously. That is, the basic coach fare, on a per mile basis,

now declines much more rapidly as distance increases than it previously did. Such "taper" is generally believed to be present in airline unit costs, though its degree is subject to some controversy. Therefore, we believe today's passenger fare structure is better cost-oriented than it has been in the past. Similarly, the differential between first-class and coach fares has been increased while the discounts inherent in the extensive promotional fare structure have been moderately reduced. Important changes in the domestic freight rate structure have also been made during this period, about which, more later.

At this point, I would like to discuss briefly the respective roles of the carriers and the CAB in the establishment of domestic rates and fares. Let me say first that I do not speak for the Board itself. My views are my own and I welcome your questions. The air carriers initiate their own rates and fares by filing, on an individual basis, tariffs showing their rates and any changes they propose to make. Such tariffs presumably reflect each carrier's best judgment in light of its costs, competitive situation, the shipper's or traveler's requirements, and the like. These tariffs are publicly filed in advance of effectiveness and may be protested by competing carriers and by users. The CAB comes into the picture at this point in the process. We review the filing in light of the economic justification furnished and any protests filed against it. We then decide whether the filing should be allowed to become effective immediately, or if there are problems with it sufficient to require suspension pending investigation.

Parenthetically, a third alternative exists, namely, we can also permit the tariff to go into effect while we investigate it. Basically, the investigation inquires into the question of the rate's reasonableness, that is, is it too high or too low, and whether the rate unduly discriminates against or prejudices persons to whom it is not available. At the conclusion of the investigation, the Board decides whether the tariff is lawful or not, and if not, what the lawful fare or rate is. I would emphasize that it is only after a formal investigation with a hearing that the CAB can establish a rate or fare. Otherwise, rates, fares, and charges are established by the carriers on an individual basis.

As a consequence of numerous domestic passenger tariff filings, as well as other considerations, in early 1970 the CAB instituted a broad investigation of all aspects of domestic passenger fares. Some matters involved in the investigation have already been decided. For example, the Board has set standards for rate-making purposes with respect to aircraft depreciation policies, allowable return on investment, aircraft seating configurations, and passenger load factor. In May, a year ago, the Board permitted the carriers to raise all fares by six percent while it further considered its tentative conclusion that nine percent was required on a permanent basis. Also pending is a decision on the lawfulness of the well-known family fare and youth fares, as well as the individual excursion fare called the Discover America fare.

This decision should issue soon. The final decision in this series, some months away, will deal with fare structure issues including fare taper and relationships between coach, first class, and other fares.

In the airfreight area, the CAB has also undertaken two very broad investigations. One of them, initiated just two years ago, is concerned with the many air carrier tariff rules by which airlines limit their liability for loss and damage to airfreight, establish procedures for filing claims, and set forth the conditions on which the traffic will be carried. The other, begun in December of 1970, is a general investigation of all domestic airfreight rates. This case is obviously similar in many respects to the general passenger fare investigation now nearing completion. I would like to discuss these two broad investigations of freight rates and rules from the standpoint of the major areas of inquiry and what the CAB staff thinks about some of these matters.

The rate investigation will be concerned, of course, with all aspects of the domestic freight rate structure.

For many years airfreight has been viewed as a by-product of the basic passenger services. Since a large proportion of airfreight was carried in the combination aircraft, carriers tended to price the service on a marginal cost and value of service basis. In the Airfreight Rate Investigation decided in 1948, the Board rejected

the added cost approach to rating freight services and established minimum rates geared to the cost of all-cargo operations. The Board stated its expectation that the carriers would evolve a rate structure above the prescribed rate floor. Airfreight rates, however, remained generally at the minimum established by the Board. With the advent of jet aircraft and increased capacity, the Board revoked the minimum rates in 1961, and the price structure continued to be more concerned with developing new traffic and increased volume than with costs of service on a fully allocated basis. Unfortunately, however, while the growth of airfreight has gradually necessitated the acquisition of separate aircraft, facilities, and personnel to handle it, the rate structure has not been overhauled in the light of current facts.

Current general commodity rates vary according to direction, westbound and southbound rates being at a higher level in numerous markets than rates in the opposite direction. General commodity rates are typically quoted for shipments of under 100 pounds, 100 pounds, 1,000, 2,000, 3,000 pounds and over. In a few markets rates are quoted also for higher weights. The highest rates per pound are for shipments under 100 pounds, with lower rates published for successively higher "weight breaks". The differences among the rates at various weight breaks, also known as volume spreads, permit consolidations of smaller shipments by forwarders. These volume spreads vary by distance, the spreads being greatest for the longest hauls.

A minimum charge per shipment assures carriers a minimum revenue for even the smallest shipment. For several years the typical minimum charge for shipments under general commodity rates was the charge for 50 pounds but not less than \$10.00. Just recently, however, the Board found the 50 pound element unreasonable and ordered it cancelled. Thus, today the minimum charge is \$10.00 in most cases. For shipments at specific commodity rates, the minimum charge is typically the charge for 100 pounds but not less than \$10.00.

Specific commodity rates, which apply to named commodities, are normally lower than general commodity rates and for the most part are applicable to eastbound and northbound traffic. They are typically published for the same shipment weights as general commodity rates, except that rates are not usually quoted for shipments below 100 pounds. Other rates applying to individual commodities, but at a premium above general commodity rates, are so-called exception rates. These are quoted as percentages of the general commodity rates, 150 percent, 200 percent, etc. Very low general and specific commodity rates also exist in a few markets for export and import traffic.

Other rates apply only to containerized shipments, involving varying discounts for several sizes of containers. In addition to an allowance for the weight of the container itself, nominal "unitization" discounts from both general and specific commodity rates are offered for traffic having densities of seven pounds or more per cubic foot. An additional discount of 33 1/3 percent is

offered on general commodity traffic having a density of over 10 pounds per cubic foot.

These rates are quoted by the direct carriers for airport to airport service. Pick-up and delivery rates are also published and the service is offered to shippers and receivers on an optional and extra charge basis. Airfreight forwarders, or consolidators, publish their own tariffs reflecting a generally similar rate structure. Forwarder rates are not included in the investigation, however.

Many aspects of the rate structure are subject to question and in some cases involve substantial controversy. For example, the number of specific commodity rates, at significant reductions below the general commodity rate level, is now quite substantial and in some cases the discounts are very large. This raises the question whether so many specific commodity rates are warranted and whether the sharp rate reductions are economically justified. Perhaps most important is what criteria or standards should be used to evaluate specific commodity rates.

Another area of controversy relates to the existing volume spreads, i.e., the differences between weight breaks. Forwarders are interested in greater spreads, between the rates for shipments below 100 pounds and the 100-pound rates, on the one hand, and rates for larger shipments, on the other. Direct carriers generally are concerned that spreads not be so large as to result in undue diversion of traffic to forwarders and uneconomic rates for large shipments consigned by forwarders.

Forwarders, of course, tend to favor a direct carrier rate structure with frequent weight breaks and substantial volume spreads applicable to most if not all commodities. Cost data have been developed by some carriers which indicate that unit cost savings are minimal above 3,000 pounds.

Eastbound and northbound rates have long been lower than westbound and southbound rates, respectively, and presumably are below fully allocated costs of service. This structure was developed because the predominant traffic flow has been in the westbound and southbound directions and reduced rates were necessary to develop traffic for the backhaul directions. At present there is currently no significant difference in volume eastbound v. westbound. Nevertheless, it is claimed that if eastbound rates were not lower than westbound, eastbound traffic would be much less than now. This problem is quite complex and deserves careful analysis.

Another important problem that has been recently focused on by a number of carriers is the level of rates for small shipments and the level of rates for all sizes of shipments for short hauls. It is claimed that such rates are below costs and should be raised significantly. Yet many shippers have come to depend upon the current rates and significant increases would have a serious impact upon them.

During the past few years, the principal carriers of domestic airfreight have proposed a series of broad and substantial changes in their rates. For the most part, the filings would have effected large increases in rates for the smaller shipments, including minimum charges, and would have made small cuts or no change at all in rates for large shipments. These filings drew numerous complaints from shippers objecting to the increases. The Board generally permitted somewhat smaller, across-the-board increases in both general and specific commodity rates.

These filings reflected a concern by carrier management for the persistently marginal economics of domestic all-cargo services. Despite rapid growth in the volume of airfreight carried over an extended period of years, a solid profit basis has not been achieved. All-cargo services are and have been a drag on over-all domestic earnings and during the past year or so the declining profit in passenger services caused increasing attention to be focused on the cargo side. Moreover, the carriers are reluctant to commit the very substantial investments required for both cargo aircraft and terminal facilities in the face of the prospect of continued marginal earnings.

For example, the volume of airfreight transported in the domestic scheduled services of the trunkline and all-cargo carriers increased from 418 million ton-miles in 1960 to 2.1 billion in 1970, an increase of 400 percent. The growth rate was even greater for the freight carried in the all-cargo aircraft. By 1970, the latter carried about 50 percent of the domestic total.

The profit picture, however, is another story. For a number of years, domestic all-cargo services have generally been conducted at operating losses. For only two 12-month periods since 1963 (those ended December 31, 1966, and June 30, 1967) have the operating revenues from such services, including a minor proportion of mail and express, exceeded operating expenses. For the 12 months ended December 31, 1971, domestic trunk and all-cargo carriers reported operating revenues of \$259 million and operating expenses of over \$294 million, resulting in an operating loss of \$35 million.

The rate increases made in the last few years have had the effect of generally raising the over-all rate level and leaving largely undisturbed, except for the minimum charges, the relationships among the various rates comprising the rate structure. While these rate increases should certainly bring revenues into somewhat better balance with costs, they did nothing to effect the improvements in the rate structure which are needed for the longer term. For example, air carrier costs in the terminal area are more affected by the number of pieces in the shipment than by the shipment's weight. Yet under the current rate structure, rates are determined almost entirely by the weight of the shipment. In the aircraft, costs are greatly affected by the density of the cargo, yet the price structure is concerned with traffic density only insofar as a minimum density requirement is concerned. There is considerable

controversy whether the current domestic minimum density rule, which imputes a weight of 6.9 pounds to each cubic foot of space displaced, is realistic in light of the traffic carried and the lift capacity of the jet aircraft in current use. It would seem that the advantages of air transportation would be optimized by a rate structure which contained incentives to the shipper to minimize the number of pieces tendered, e.g., by using containers, and to maximize the density of the shipment. However, the total air transportation system should not ignore the small shipper or shipment or price this service unreasonably.

In this connection, I would observe that meaningful study of this whole area is hindered, if not precluded, by the lack of factual data. Traffic, revenue, and cost data are reported by the carriers essentially on a domestic system basis. Traffic data are limited to tons enplaned by station and system ton-miles carried. Data are not available as to the kinds of commodities carried, the number of shipments, number of pieces, volume by weight, etc. A break-out between traffic carried at general commodity rates and specific rates is not even available. Cost data are by and large limited to the over-all costs of the all-cargo services and, without a good deal of the statistical data enumerated above, not much can be done by way of more detailed costing, for example, costs of handling small v. large shipments.

We know that the various carriers maintain their own records in varying detail and that they have attempted some cost studies. However, these data and studies are not generally made available throughout the industry and they are probably far from uniform as among the carriers.

The initial phases of the rate investigation are being devoted, therefore, to developing necessary but presently unavailable data. We and the carriers have devised a method for sampling 10 percent of their airfreight shipments. This study should reveal a good bit about traffic patterns and markets, including the origin and destination points of some 120 different airfreight commodities. Other information will be the rating basis, that is, whether the general commodity or a specific commodity rate was used, shipment size, and number of pieces.

To afford some new insight into the important area of terminal costs, we and the carriers have contracted for a \$200,000 study by an independent consultant. This firm will study operations at 23 airline cargo terminals plus two airfreight forwarder terminals. The purpose is to study the influence on terminal costs of handling the various types of shipments with different characteristics. A corollary purpose is to develop a reliable methodology by which carrier-reported traffic servicing expenses can be fairly allocated among the various types of traffic handled, including mail and express.

Thus armed with much new, and hopefully useful information, we, the air carriers, and the shipper parties will begin the hearing phase of the rate investigation sometime early next year. Each of us will introduce reams of evidence calculated to prove conclusively that our conclusions and recommendations are reasonable and that the other fellows' aren't.

One of the matters we can expect to be sharply contested is the basic question whether airfreight is to be viewed as a by-product of the much larger passenger services or as a joint product. This is a fundamental issue since it affects the amount of jointly produced costs of operations -- and this would include most airline costs -- to be assigned to airfreight. This in turn affects freight rate levels -- assuming rates in the aggregate should cover costs in the long run -- and, through the rates, the demand for airfreight services. The real life implications are most important. Rates that are unnecessarily high are unfair to present shippers and will inhibit market growth. Rates that are too low, that is, rates which do not cover the true, full costs of service, will inevitably burden other airline traffic and lead to a misapplication of resources.

This issue will be sharpened by the existence of very substantial amounts of cargo capacity provided by the wide-body aircraft. These belly compartments are fully capable of containerized operations

on a scale comparable to the narrow-body all-cargo aircraft. The argument will be made -- and it's a compelling one -- that such capacity is produced as a by-product of the extensive passenger services and can be used for carrying large volumes of airfreight at little or no additional capacity cost.

My own tentative and personal view on this question is that the airfreight rates should bear an appropriate share of the costs of operating the passenger aircraft. First, I would venture the opinion that by-product pricing of airfreight -- which in essence says that the passenger will pick up the difference between total costs and the amount paid by the airfreight ~~the~~ shipper -- represents no meaningful standard at all to judge the reasonableness of airfreight rates. This approach would result in airfreight rates fluctuating inversely with passenger revenues. Carrier managements would be in a poor position to make economic judgments concerning the provision of additional airfreight services which, to an increasing degree, involve separate and costly aircraft, terminal facilities, and people.

During the past several years, I have become quite skeptical of the viability of the "any-how" theory of setting airline rates and fares. The nub of this theory is that the seat or flight is being operated anyhow and that almost any rate will therefore cover out-of-pocket costs and make a contribution to profit. This theory has been used to justify many a discounted fare and rate,

but it is by no means clear that carrier profits have been thereby improved.

In my opinion, it is extremely difficult to demonstrate, one way or the other, the effect on capacity costs of carrying belly cargo. Airline capacity costs are mostly variable, except in the very short-run, and vary principally with the volume of miles or hours flown. The latter are quite responsive to traffic and relatively small traffic increases seem to generate the operation of additional flights. Moreover, it is quite doubtful that flight schedules catering to the needs of the passenger markets would adequately serve to develop potential airfreight markets. For one thing, the timing of most passenger flights is not well suited to the next-day-delivery requirements of many shippers. But, pricing the cargo services as a by-product of the passenger schedules will reduce the economic viability of all-cargo flights and tend to increase reliance on passenger flights. This will in turn increase the likelihood that belly capacity on passenger flights will in fact be provided at times, not as a pure by-product, but specifically for the airfreight market.

Other fundamental issues in the investigation include the specific commodity rates, weight breaks, and directional rates. Specific commodity rates are principally promotional devices to induce new shippers to use air transportation for their products. Historically, these rates have been used most in the eastbound and northbound directions to help counterbalance the normally heavier

traffic flows in the opposite directions. The specific commodity rate structure today includes a wide range of discounts from general commodity rates reflecting carrier judgments as to the rate level necessary to attract the traffic. They are largely unrelated to costs of service and are inherently discriminatory among shippers of different products.

In my opinion, specific commodity rate pricing makes sense only in small doses. But when numerous such rates are established and the traffic volume becomes quite large, the carrier's average freight rate, or yield, is diluted. Eventually, increases in other rates, or in all rates, become necessary to recover the over-all costs of the airfreight service.

I would like to see less reliance on this type of pricing and more use of the general cargo rate structure. Rate variations should be encouraged to reflect different traffic characteristics -- its density, relative fragility, perishability, and the like. For example, because of the significance of traffic density in present-day aircraft, a price incentive should be given to encourage higher density traffic, and the reverse. By the same token, because terminal handling costs are substantially influenced by the number of pieces in the shipment, I would like to inject a "piece" charge in the rate structure.

Weight breaks, that is, unit price reductions for larger shipments, present somewhat similar issues. At one time, weight breaks were mostly a promotional device and bore little resemblance to cost savings inherent in larger shipments. In the last few years, the domestic carriers have largely eliminated weight

breaks above the full-sized pallet or igloo -- about 3,000 pounds. This is quite sound, in my view, since I do not believe that the cost per pound is measurably less for shipments of, say, 5,000 or 10,000 pounds than for 3,000 pounds. Below 3,000 pounds, however, it is my opinion that costs per pound rise quite sharply as shipment size declines because ground handling costs, documentation, billing, etc., do not closely correlate with shipment weight but represent more of a constant factor influenced by the number of pieces in the shipment and special handling characteristics of the traffic. We hope the terminal cost study, I mentioned earlier, will develop a good basis for determining how much weight taper should be reflected in the rate structure. The same basic information as ~~to~~ terminal handling costs should also provide guidance with respect to the appropriate degree of distance taper in the structure.

Summing up, I believe that a well-designed container program and price structure would meet most of these objectives and would afford advantages to both carriers and shippers. It would offer incentives to the shipper to reduce the number of pieces and increase the density per shipment. This would reduce carrier costs of operation. Eventually, perhaps, this type of structure could replace much of the present specific commodity rate structure. Corrollary benefits would include much safer transportation with fewer instances of loss, pilferage, and damage and fewer claims.

This leads me to our second major investigation relating to airfreight -- namely, our inquiry into the reasonableness of the carriers' tariff rules governing their liability when a shipment

of airfreight is lost or damaged. The domestic airlines basically limit their liability for loss and damage to 50 cents per pound or \$50, whichever is greater. There are exceptions for certain items for which a lower limit is prescribed. In most cases, the shipper at his option may declare a higher valuation on his goods subject to payment of an additional charge. The carriers also publish tariff rules on packing requirements as well as rules governing the filing of claims. The 50 cents per pound liability limit differs from the practice in surface transport where the carriers are responsible, with some exceptions, for the full value of the goods lost or damaged.

During the last few years the CAB has received many complaints from shippers about the arbitrary liability limit, the bases on which claims were denied, and the lack of uniformity of rules among air carriers and with surface carriers. The CAB instituted the present investigation two years ago to look into these matters.

As was the case in the rate investigation, our first step was to undertake a comprehensive survey of shipper claims. This is the first such survey so far as I know. Our survey covered the periods January to June and September-October 1971. It covered some 8,400 claims which were analyzed to determine the amount of the loss, the reason for the loss, the commodities involved, the amount paid, and other information.

For domestic claims over \$25, 9 percent were denied in full, 27 percent were paid or denied in part, and 64 percent were paid in full. Those percentages are based upon the number of claims

in the various categories, irrespective of the dollar amount claimed. When you make a similar analysis on the basis of the dollars represented by these claims, you get a different picture. On that basis, 10 percent were denied in full, 52 percent were partly paid, partly denied, and only 38 percent were paid. For goods with a value of 50 cents per pound or less, a much higher percentage of the amounts claimed was paid (about 70 percent) reflecting the fact that such traffic was not subject to the arbitrary valuation limit. Above 50 cents per pound, only one-third were paid, reflecting, of course, the impact of the valuation limit.

The 50 cent per pound valuation limit goes back to the early days of civil aviation and is, in my opinion, no longer valid. It should be changed. It may be contrasted, for example, with the \$8.00 per pound limit which applies internationally pursuant to a treaty among most nations.

In my judgment, it is simply not in the public interest or conducive to the development of a sound airfreight transportation system to perpetuate a rule which denies in whole or in part a substantial portion of claims filed. It is bad enough to lose or damage the customer's goods but to deny the ensuing claim on the basis of an arbitrary valuation limit is adding insult to injury. Many shippers are unaware -- at least the first time -- of such limit and the necessity to declare and pay for added protection. Moreover, most claims stem from loss not damage. This would suggest that most of the problem arises from the carriers' own negligence not some frailty inherent in the goods.

In fact, I have heard it suggested that the 50 cents per pound limit means it is cheaper for carriers to pay claims up to that amount than to protect the property entrusted to their care. Whatever the truth of that assertion, it is clear that carriers should and, in fact, can better protect airfreight -- witness the progress made at JFK -- and a higher limit on their liability would increase their economic incentive to do so.

In place of the present rule, I believe a rule of substantially full common carrier liability should apply. In other words, a carrier should be responsible for damages due to his negligence, with some exceptions, up to the value of the goods lost or damaged. However, I would not expect a carrier to assume full liability for commodities of very high value -- for example, currency, jewels, art works -- especially when the carrier has no knowledge that such articles are being carried.

There are, I believe, two ways to solve this problem. The first would allow a carrier, upon proper documentation, to establish liability limits on a limited number of specifically identified articles of very high value. At the same time, the carrier would provide the shipper the option to declare a higher ~~f~~valuation at an additional charge. The second approach would be simply to substitute a much higher limit, say \$8.00 to \$10.00 per pound, for the present 50 cents, coupled with the option to declare a higher value at extra cost.

Both approaches would afford most shippers and shipments coverage for full value. Both approaches would protect carriers against very large claims on very valuable goods. We hope to explore the pros and cons of both alternatives in the pending investigation with the full participation of the carrier and shipper parties. At the moment, I lean toward the second alternative mostly because it seems a little simpler to me.

In closing, I hope that I have given you some insight into airfreight tariff problems now pending before the CAB. While we may tend sometimes to make these matters sound very complicated, what is really involved is the price for a service and the terms under which it will be performed. As such, these matters vitally affect the interface between carriers and users of air transportation as well as their individual interests. Our purpose is to see that such prices and rules are fair to both parties and consistent with the public interest.

N73-32884
Lewis M. Schneider

THE FUTURE OF THE U. S. DOMESTIC AIR FREIGHT INDUSTRY

A Presentation at the Summer Workshop on
Airline Systems Analysis and Economics

Flight Transportation Laboratory
Massachusetts Institute of Technology

Introduction

This paper will present some of the findings of the author's recently completed research project on the future of the U. S. domestic air freight industry. The research questions of the study were: a) during the period 1965-1969, when the airlines introduced jet freighters into domestic service and air freight traffic growth continued at a high rate, what strategies were employed by management and with what results, and b) what are the opportunities and problems confronting the domestic air freight industry during the 1970's and 1980's?

The U. S. Domestic Air Freight Industry

Between 1959 and 1969 U. S. air freight traffic increased at an annual rate of almost 15%. During shorter time periods, the growth was even more dramatic - for example, between 1964 and 1968 scheduled air freight traffic carried by the combination carriers increased at an annual rate of almost 22%. Most forecasts of U. S. air freight growth made during the mid and late 1960's anticipated that air freight traffic would grow at annual rates of 19-22% per year.

*The Future of the United States Domestic Air Freight Industry, Division of Research, Harvard Business School, to be published 1972-3.

Over one-half of the freight ton miles moved in freighter aircraft by the end of the study period and four carriers - American, United, Trans-World, Flying Tiger - accounted for over 83% of the scheduled domestic freighter revenue ton miles. U. S. air carriers now gross over \$1.2 billion per year in their domestic plus international freight, express, and mail traffic. Scheduled freight revenue of the domestic trunklines plus Pan American for the twelve months ended March 31, 1972, alone totaled \$662 million. The aforementioned four carriers analyzed in this study grossed almost \$200 million in the domestic freighter operations in 1971.

The Results of Management Freighter Strategy 1965-1969

This study focused primarily on the strategies employed by airline managers in their freighter service because a) the author believed that the principal measure of corporate commitment to air freight was the percentage of freight carried on freighters, b) the importance of freighter traffic as a percentage of total freight traffic and c) the availability of CAB data on freighter operations.

The use of the percent of freight carried on freighters proved to be somewhat controversial. Some maintained that aggressive solicitation of belly cargo was legitimate evidence of a commitment to air freight.

Yet, traditionally, the airlines have rewarded their managers on the basis of performance in passenger operations. Many times during the course of the author's interviews, comments of this type were heard: "air cargo is a second class citizen", and "the passenger group does all the planning, we have to do the selling", etc. No combination carrier has established air freight as a separate and distinct organization with complete return on investment responsibility. In the author's opinion, investment in freighter planes is the next best measure, for it indicates the degree to which management has "cut the cord" and ceased to think of air freight as a byproduct of the passenger business. It should be noted that during the mid-1960's, aircraft manufacturers were predicting that by 1975, 80% of the U. S. domestic cargo would move on freighter flights.¹

Other management input variables analyzed besides "commitment to air freight" included equipment, routes and schedules, pricing (that is, the decisions concerning target traffic mix, scheduling, and choice of equipment which ultimately led to an average yield per revenue ton mile), and other marketing expenses (advertising, promotion, and sales).

The Results of Management Freighter Strategy

The results were reported under the headings of a) traffic and share of market, b) operating efficiency, and c) financial. Statistical analysis revealed that freighter market shares were almost directly proportional to freighter capacity shares. There appeared to be little, if any, disproportionate returns to capacity increases. (Slide 1)

There was little evidence of economies of scale (marginal costs declining as volume increased) in freighter service once jets were introduced. Deflated total operating expenses in 1958 dollars increased proportionately to increases in available ton miles during the period. (Slide 2)

On the other hand, there was some evidence that the traffic service component of operating expenses did display economies of scale. (Slide 3)

But, perhaps the most interesting findings were financial, and the implications for the future of the U.S. domestic air freight industry are extremely important.

Despite the five year period of substantial traffic growth, only American Airlines was able to show a cumulative profit from its freighter operations. (Slide 4) In no instance was the return on investment satisfactory. Indeed, United's freighters showed a cumulative loss of almost \$7 million between 1965-1969 on a \$142 million investment. For the twelve months ending December 31, 1970, U. S. domestic freighter planes lost \$45.2 million before taxes, and for the twelve month period ending June 30, 1971, the operating loss climbed to \$54.8 million.²

Two financial ratios of significance in the transportation industry are the operating ratio (operating expenses divided by operating revenue) and the capital productivity ratio (revenue to net investment). As indicated in Slides 5 and 6, domestic air freighters had the unenviable distinction during the study period of combining the operating ratio of the motor carrier industry with the poor capital productivity of the railroad industry!

Within this general pattern of financial distress, evidence was obtained which linked some of the output measures with management inputs. For example, there was a positive correlation between percentage of cargo carried on freighters by the combination carriers with freighter operating profit lending support to the proposition that strong management commitment could influence profit performance to an extent. Clearly, increases in capacity resulted in increased market share, although profits were not guaranteed. United, for example, found that its freighter traffic, market share, and profits improved substantially during the period 1965-1968, but a combination of reduced traffic growth and substantial increases in operating expenses caused profits to plummet in 1969. It then compiled the worst profit record of the study domestic freighter carriers in 1970 and 1971.

As indicated in Slide 7, profits were highly volatile and responded dramatically to relatively small changes in the relationships between percentage change in capacity, traffic, operating revenue, and operating expenses. Efforts to derive statistically formal relationships between profits and the management inputs proved impossible.

One is left with the intriguing question of why management chose to make substantial investments in air freighter service in the face of such risky and unappealing economics. Were they in effect following a "buy in"

strategy so as to achieve strong market shares before the introduction of jumbo jet aircraft, and further hoping that the jumbo jets would generate the adequate return on investment so conspicuous by its absence in the history of the industry?

The second section of the study was designed to analyze the outlook for the U. S. domestic air freight industry keeping in mind its performance over the previous decade.

The Future of the U. S. Domestic Air Freight Industry

The study analyzed the future of the U. S. domestic air freight industry with three underlying questions in mind: a) will air freight traffic continue to display the high growth rates as in the past, b) what will be the competitive cost relationships between the domestic modes of transportation, and c) how will the economics of the industry depend upon future costs, prices, industry structure, and intra-industry competition?

Traffic Projections

At the risk of oversimplification, air freight traffic was divided into three basic categories for analysis: a) emergency traffic which is unplanned and highly time sensitive, b) routine perishable which is time sensitive but planned, and c) routine surface divertible which is planned but less time sensitive. A recent speech by an official of United Airlines suggested that the growth opportunities for emergency and routine perishable may not be as dramatic as many had hoped.³ He also questioned the ability of domestic air freight to divert substantial amounts of surface traffic. He concluded that domestic passenger traffic would grow at an annual rate of 10% with cargo traffic lagging behind.

A revised forecast of domestic air freight plus express ton miles by the CAB in 1971 also lowered expected growth rates from those developed during the 1960's. The CAB staff study concluded that during the period 1971-1975 annual growth rates would be 10.4%-15.8% per year depending on air freight pricing policies.⁴

In short, the traffic growth picture is what might be termed variably optimistic. All studies predict growth, with the most likely rates over the next several years falling into the 8-12% range. But, the important question for the industry is not one of traffic growth, rather it is whether this traffic will be carried at a satisfactory return on investment.

Comparative Transportation Costs

In order to better understand the probable competitive environment of the domestic air freight industry, projections of transcontinental operating costs were made on the basis of historical costs and factors which would affect these costs in the future. Because of the many uncertainties - not the least of which is the future policy of the Pay Board - a parametric approach was taken which in effect spotlighted competitive relationships under a range of assumptions as to changes in annual costs.

As indicated in Slide 8, line haul costs for air freight and trucking could overlap if the airlines introduced jumbo jets. On the other hand, most likely trucking costs will still be below that of air freighters utilizing 707 or stretched DC-8 equipment. But, more significantly, transcontinental rail container trains would undercut both competitors by a substantial margin.

When projected terminal costs are added to line haul, rail's competitive advantage is amplified, and trucking maintains a slight edge over even jumbo air freighters. (Slide 9) Should the pricing policies of the carriers reflect their relative costs, it would be difficult for air freighter rates to be reduced to levels sufficient to attract substantial routine surface divertible traffic unless jumbo jets were introduced.

Financial Issues

Depending on assumptions as to costs, load factors, and yield per revenue ton mile, it is possible to project a variety of financial scenarios for air freighter service in the decade ahead. For example, at 50% load factor and yields of 10.5¢, 12.5¢, 14.5¢ and 16.5¢ the time adjusted return for 747 freighter aircraft would be 0%, 4%, 20%, and 35% before taxes respectively during the 1970's.

With return on investment potential of greater than 20%, what are the risks of investing in jumbo freighters? There are many as noted in the following:

1) Ironically, despite the greater capacity of a jumbo freighter, one can demonstrate that on the basis of historical performance, the carriers might price their service so as to reduce the capital productivity of the 747's below that of the turbo-prop CL-44's. (Slide 10) For example, had the 747 jet freighters been introduced in 1969-1970, it is not unreasonable to predict that average yields would have declined to 12¢ per revenue ton mile. The capital productivity would have declined from 1.52 (CL-44 at 20¢ per RTM) to 1.46 (747F at 12¢ per RTM) despite the massive investment. As we have seen, the ratio of air freighter revenue to net investment slide 6 is not impressive. Indeed, air freighters are perilously close to becoming "railroads with wings" on the basis of capital productivity.

2) The jumbo jet operating costs estimates are predicted on dramatic reductions in terminal costs stemming from containerization. One recent study warns that terminal investment and operating costs may be substantially higher than anticipated.⁵ In view of the fact that most air shipments weigh less than 100 pounds, there will have to be changes in the industry structure so that the container stuffing takes place at a distance from the expensive airports. This implies even greater responsibilities for the forwarders and consolidators, and the airlines may not be willing to let intermediaries play a larger role.

3) The jumbo jets will require a massive investment in new rectangular containers. It is still not clear how well these containers will withstand the rigors of over-the-road feeder service, nor whether the problems of scheduling their use will be difficult.

4) Perhaps, most crucial, are the assumptions as to actual load factor. Containerization has promised great cost savings benefits to all modes of transportation, but the need to make substantial capital investments has led to rate cutting and overcapacity as well. The recent "overtonnaging" on the North Atlantic was a familiar and painful story to observers and participants alike. Unless schedules are regulated, load factors could plummet to uneconomic levels. Although the breakeven load factor

of a jumbo freighter is below that of 707's, the cost per aircraft mile increases, substantially magnifying the risks. At least when the airlines went from piston freighters to the 707 they could hedge their risks with the knowledge that costs per plane mile and per available ton mile would decline.

In addition to the pressures on load factor from the introduction of jet freighters, the airlines operating freighters face competition from private air carriage and the substantial amount of belly capacity available to the combination carriers operating the new wide-body passenger jets.

5) Factors in the external environment will also affect the potential profits. On the positive side are regulatory decisions which will promote intermodal transportation and make combination air-truck service more viable.⁶ If the economy continues to recover in a satisfactory manner and renew its long run growth pattern of 4-5% per annum, air freight traffic should continue to grow at a pace greater than most industries in the nation.

Yet, the problems of noise pollution and restraints on the availability of land in urban areas will affect the air freight industry substantially. There is a high probability that flights will be restricted between 11 p.m. and 6 a.m. at major urban airports, precisely the prime time for freighter departures. This will create even more pressure for all-cargo airports in rural areas fed by surface transportation. Although this system might work well for freighters, it would prevent the combination airlines from spreading their terminal costs over freighter and belly volume.

Marketing Implications for the Carriers

As shown in Slide 11, customer requirements and the management responses differ dramatically depending on the nature of the air freight traffic. Clearly, a universal set of policies - price, pick up and delivery,

special services, schedules, etc. - will not meet the diverse needs of the shippers. Also, it is highly unlikely that these three classes of traffic are equally profitable. Finally, the degree to which a carrier decides to concentrate on any one or more of the three categories has important structural implications for the industry.

For example, carriers that strive for routine perishable traffic will not have to make the same investment in educating their sales force in the difficult "industrial marketing" task of selling the service through a total cost analysis. On the other hand, routine perishable traffic is time sensitive, is often seasonal, and can lead to volatile profit performance, even though the traffic as a whole represents routine decisions.

When the spatial as well as the time element is included in the analysis, institutional responsibilities become very important. A shipper who tenders surface divertible cargo destined to off line as well as on line points may prefer to work through one of the large forwarders, who specialize in controlled routings via several carriers.

Pricing of routine perishable traffic requires knowledge primarily of demand factors, but pricing of routine surface divertible must consider cost trends throughout the alternative distribution systems.

In summary, the degree of sophistication of selling ranges from low to very high as one moves from emergency to routine surface divertible. On the other hand, the response and speed requirements move in the opposite direction. Thus, it would seem reasonable for the airlines to develop broad goals as to what percentage of shipments, tonnage, and revenue fall into these three broad categories, before moving ahead to price out individual shipments. The analogy might be made with the decisions of a manufacturing company to generate a given percentage of its revenue from one broad product line. This strategic decision has major policy implications in terms of selling policies, pricing, channels of distribution, etc. Within the broad product line more specific individual product decisions can be made subsequently.

Unfortunately, it will not be easy for the airlines to establish these broad policies, for some carriers don't know how much of their traffic

is truly emergency, perishable, or could move by surface. In one instance the author had the opportunity to ask several airline executives in one company what proportion of the air freight traffic they thought was emergency versus surface divertible. They answered 25% to 40%. The cargo manager then spoke up and said that on the basis of a recent survey, over 75% of the traffic was in fact moving because of a shipper perceived emergency. Without special studies, perceived impressions of traffic may be completely erroneous.

Strategic Decisions

Yet the marketing decisions are but one aspect of what can be called strategic decisions. The airlines have just emerged from one of their cyclical periods of overcapacity, reduced traffic growth, and staggering deficits. Now is the time for them to plan their strategy, lest they again be lured into the high growth, high risk of overcapacity scenario.

In the air freight segment of the industry, this will require specification of a variety of strategic decisions, each of which can be measured and monitored. Eleven of these choices have been arrayed in slide 12.

High Risk Scenario

The high risk scenario for the combination carriers is to repeat the strategy of the past; namely, cut rates on belly cargo to stimulate volume, over-invest in a new generation of freighters, and price their service at rates which are insufficient to yield a favorable return on investment given the patterns of competition and the economics of the aircraft and ground systems.

Any pricing policies based on short run by-product costs of belly operations will threaten the potential profitability of freighter service for both the combination and all-cargo carriers and impair the ability of the industry to develop its services around a sound base of freighter operations.

Another component of the high risk scenario would be for the carriers to integrate vertically and provide a full range of services including ground transportation, terminal services, and inventory control. The airlines, in contrast to major surface carriers or forwarders such as United Parcel Service, have had difficulty in operating efficient surface logistics systems. In large measure, this has been because of the nature of air freight - small shipments, often perishable commodities, etc. The surface carrier or forwarder can depend upon a large volume of surface traffic to absorb overhead costs, whereas the airline or specialized air freight forwarder often does not have the volume which can produce economies of scale.

Low Risk Scenario

A highly controversial, but low risk strategy for the combination carriers would be to phase out their traditional competitive air freighter service, spinning off terminal operations to the forwarders, motor carriers, or warehousemen, and promoting containerized belly service. Or, if they wanted to continue both belly or freighter service, they could follow a policy of accepting cargo tendered only in containers for freighter flights, with the combination flights handling belly containers and loose packages. The extra handling expenses incurred in the processing of packages would be traded-off against the fact that the line haul combination aircraft flight costs would be borne primarily or even exclusively by passengers.

A third low risk strategy for the combination carriers would be to submit a proposal to the CAB to pool their freighter operations and create a strong all-cargo competitor to Flying Tiger for domestic traffic. The objective would be to have two domestic all-cargo carriers with broad route authority operating at profitable load factors.⁷

A final low risk strategy for freighter operators would be to investigate the possibility of moving transcontinental "route surface divertable traffic" by rail container, rather than by air. If our estimates of costs are correct, rail will have a substantial competitive advantage.

Perhaps a "super forwarder" owned and operated by a consortium of airlines and surface carriers could provide the traffic and management necessary to insure that the railroads exploit their ability to provide fast service at low cost. There will be problems, to be sure, not the least of which is that the current level of traffic will support probably only one rail route.⁸ Yet, if successful, it could mean that domestic air freight would be restricted to emergency and routine perishable traffic by 1980.

Implications to the Civil Aeronautics Board and U.S. Department of Transportation

Many of the issues discussed in this study involve the promotional and regulatory policies of the Federal government. Industry structure (entry, merger, exit), routes, pricing, and scheduling in the passenger sector directly require action by the CAB. An additional function which is crucial to the future of domestic air cargo is suggested by the analysis and findings of this research, namely that a series of alternative scenarios for the industry must be developed in sufficient detail so as to guide the carriers, regulatory and promotional agencies, and other interested parties in their future activities. The CAB and DOT must individually or jointly take the lead in providing the environment and support for long range planning. If the industry continues to rely primarily on individual decisions by a host of competitors, goaded by the sales efforts of the aircraft manufacturers, the prospects for financial success seem poor.

Currently, the CAB has reactivated its study of the air freight industry. The emphasis is to be on rates including commodity discounts, distance taper, weight breaks, density incentives, etc. Although pricing is obviously important, the findings of this study suggest that the investigation should be broadened to include the fundamental questions of industry structure, competition, and economics.

Rather than an exercise in legalistic maneuvering, one would hope that the investigation could provide the setting for the following kinds of activities:

1) Development of alternative financial futures for domestic air cargo using simulation techniques including assumptions as to price, load factor, scheduling, equipment selection, costs and load factors of competitive modes, nature of traffic (emergency, routine perishable, routine surface divertible), industry structure, and environmental constraints.

The cost of this kind of analytical exercise might appear to be substantial, yet in comparison with the operating losses to date from freighter service, and the prospects of future losses, the true costs would be low.

2) Provide an open forum whereby the key assumptions underlying domestic air freight profitability could be aired in a manner conducive to specific actions which could resolve the problems. Too often the various forums on air cargo have been either opportunities for the aircraft manufacturers to promote a new generation of aircraft, sessions where the "haves-nots" complain about unfair treatment from the "haves", (e.g., all-cargo versus the combination carriers) or sales efforts to woo new shippers.

Perhaps a series of workshops utilizing presentations, case studies, computer exercises and the like, attended by representatives from the air carriers, suppliers, and government could bring the issues to the surface and contribute to the debate necessary for restructuring.

Obvious topics would include the future of Air Express, the existing air freight forwarders, the railroads and motor carriers acting as the "new" air freight forwarders, the role of the all-cargo carriers, strategies for the combination carriers, a timetable for the introduction of a new generation of freighter equipment, and perhaps most important, a better feel for the future mix of air freight traffic - emergency, routine perishable, and routine surface divertible.

One would hope that the Air Transport Association of America and the major carriers would take the lead in broadening and structuring the CAB investigation in this direction. Otherwise, the regulatory agencies will be left in their usual unenviable position of scrutinizing the short term decisions, while the long term strategic issues - primarily choice of equipment - go unquestioned. Yet, once the equipment choices are made, it's often too late to prevent competitive chaos.

It will not be easy for this kind of long range participatory planning activity to take place. It is not unreasonable to assume that the individual airlines within the air freight industry are skeptical that joint planning could really succeed. It's almost a question of ideology. The pragmatic behavior of management to date almost assumes from the outset that cooperative planning with strong inputs from centralized government are doomed to failure.

The time for resolution of the problems of the air freight industry is running short. One hopes that a new spirit of cooperation will emerge to challenge the assumptions of the past and recast the structure and practices of the industry for the future.

Otherwise, the U. S. domestic common carrier air freight industry will remain frustrated and confused. In the midst of technological progress and traffic growth, profits will be found wanting. The optimists will look to the future for salvation but their hopes will not be realized.

Slide 1

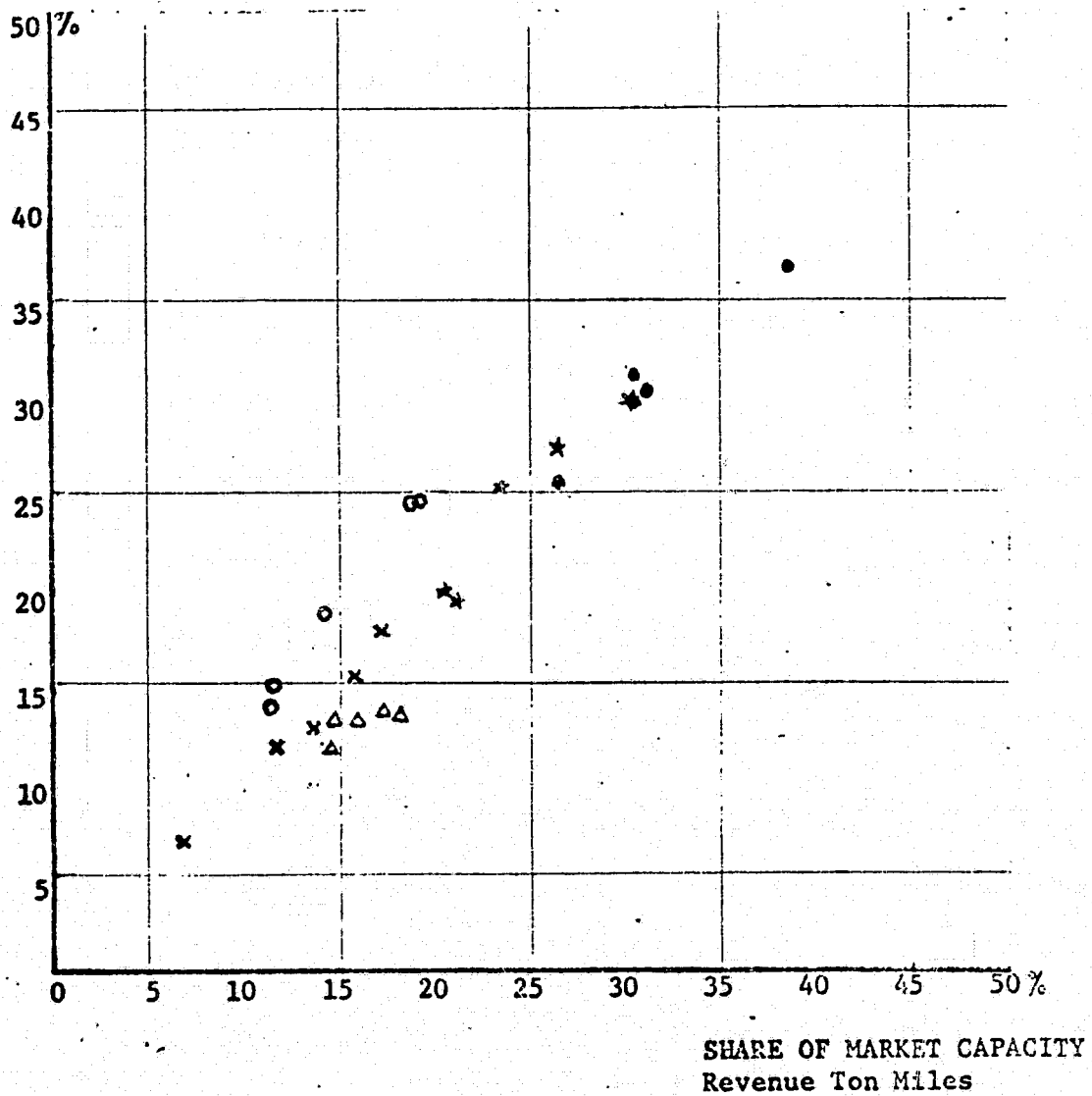
U. S. DOMESTIC AIR FREIGHTER SERVICE

1965-1969

MARKET SHARES - CAPACITY vs. TRAFFIC

STUDY CARRIERS

SHARE OF MARKET
TRAFFIC
Revenue Ton Miles



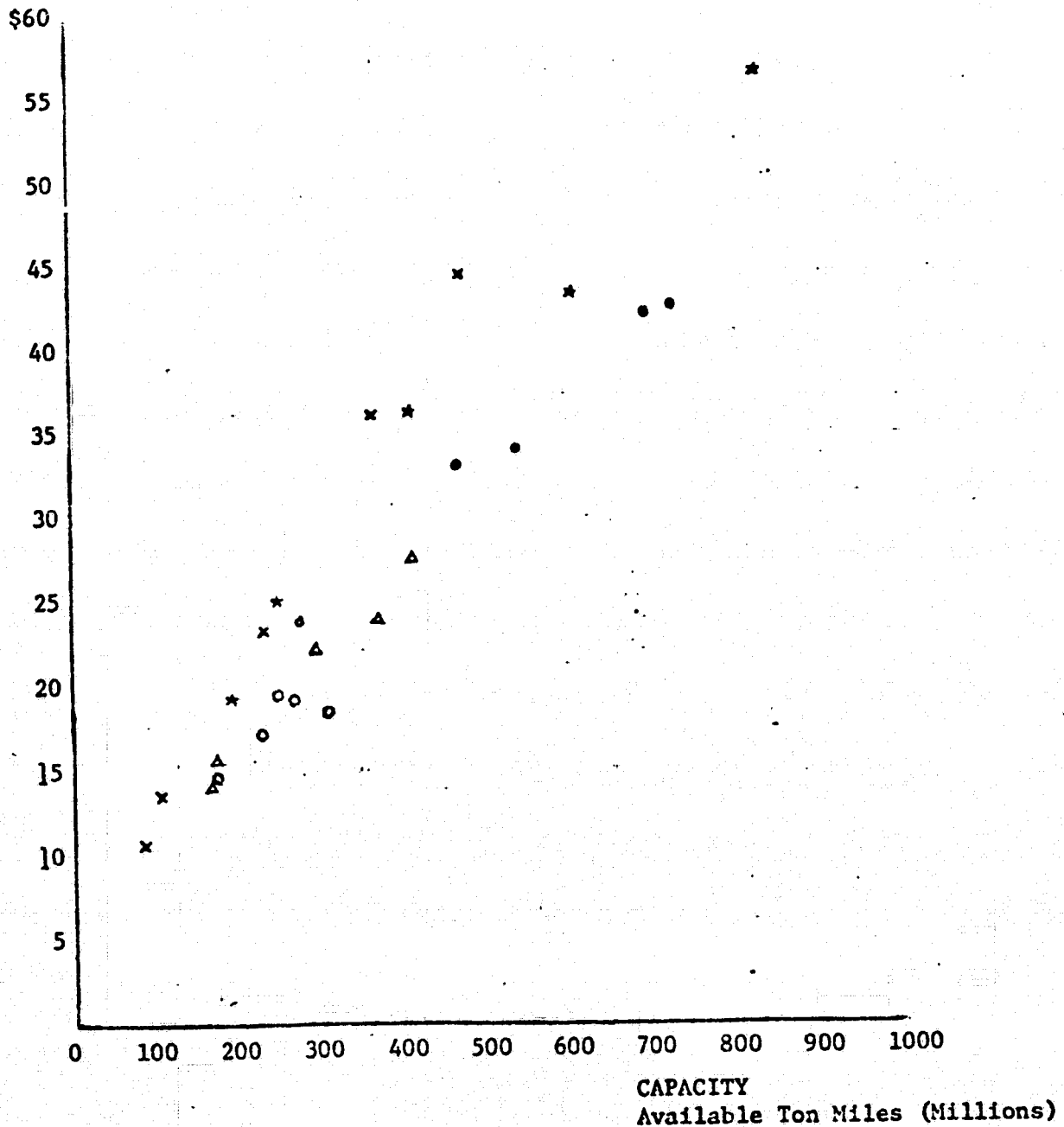
Slide 2

U.S. DOMESTIC AIR FREIGHTER SERVICE 1965-1969

STUDY CARRIERS

OPERATING EXPENSE DEFLATED vs. CAPACITY

OPERATING EXPENSE DEFLATED
Constant \$1958 (Millions)



- American
- ★ United
- △ TWA
- Flying Tiger
- × Other Carriers

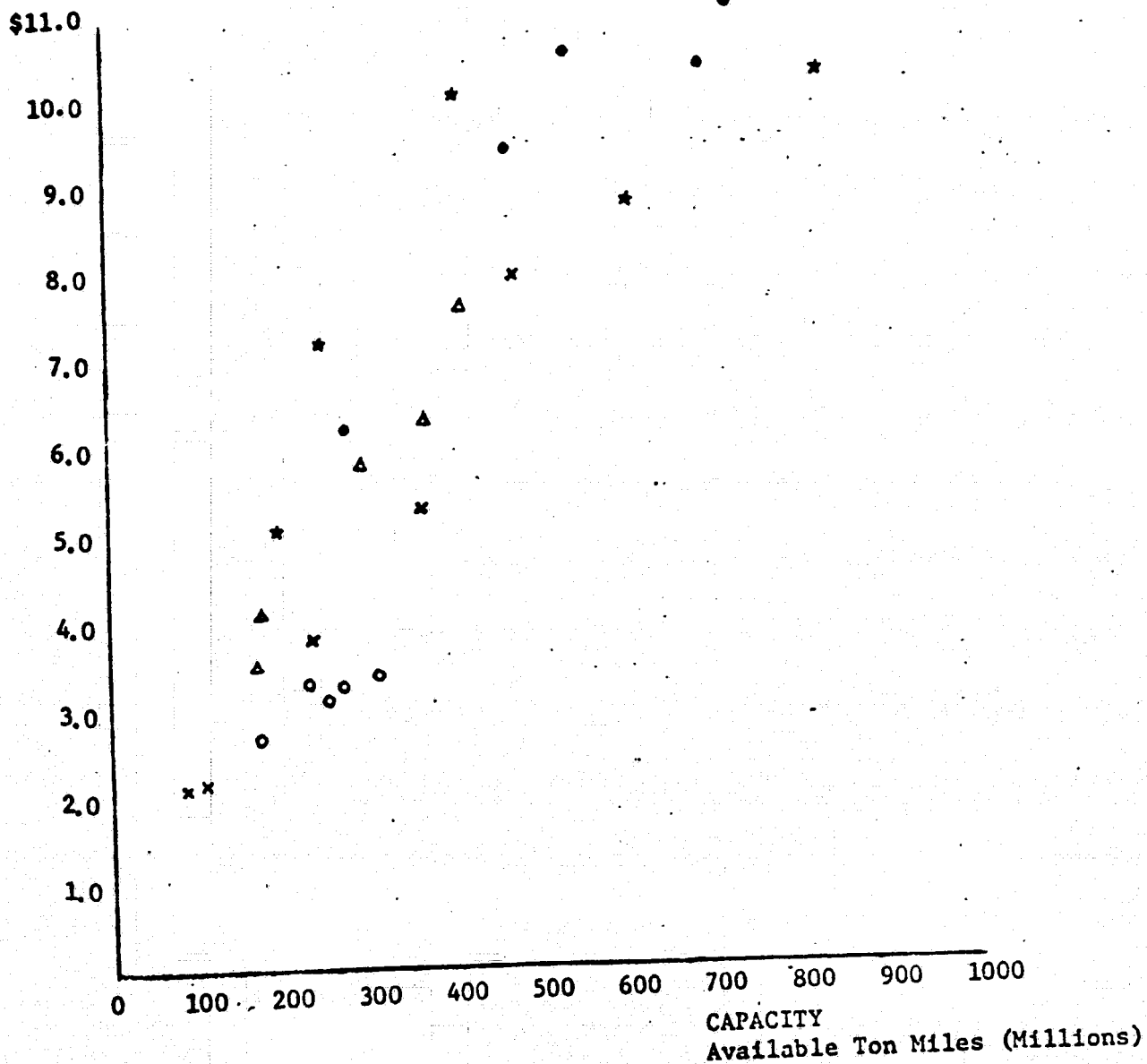
Slide 3

U.S. DOMESTIC AIR FREIGHTER SERVICE 1965-1969

STUDY CARRIERS

TRAFFIC SERVICE EXPENSE DEFLATED vs. CAPACITY

TRAFFIC SERVICE EXPENSE DEFLATED
Constant \$1958



- American
- ★ United
- ▲ TWA
- Flying Tiger
- × Other Carriers

Slide 4

CUMULATIVE PROFITS BEFORE TAX 1965-1969
and INVESTMENT IN AIR FREIGHTER OPERATIONS 1969

STUDY CARRIERS

	Air Freightier Operations Cumulative Profits Before Tax 1965-69 (\$Million)	Net Investment in Scheduled Air Freightier Operations 1969 (\$Million)
American	\$3.022	\$104.4
United	-6.981	\$142.2
TWA	-18.530	\$54.7
Flying Tiger	-4.679	\$54.8

Source: CAB

Net Investment includes working capital, flight and ground equipment, investments and special funds, long term prepayments, developmental and pre-operating costs, and unamortized discount and expense on debt.

Slide 5

COMPARATIVE OPERATING RATIOS

RAIL * TRUCK * AIR FREIGHTER

SELECTED YEARS

	<u>High Profit Year</u>		<u>Low Profit Year</u>	
U. S. Railroads	.7618	(1966)	.8118	(1970)
Class I and II Motor Carrier	.947	(1965)	.962	(1970)
Air Freighter Operations:				
American Airlines	.8875	(1966)	1.095	(1969)
United Airlines	.970	(1967)	1.136	(1965)
Trans World	1.127	(1968)	1.196	(1965)
Flying Tiger	.871	(1966)	1.160	(1968)

Sources:

Association of American Railroads, Yearbook of Railroad Facts
& Figures - 1971.

American Trucking Association, American Trucking Trends 1970-71
CAB, Form 242.

Slide 6

COMPARATIVE CAPITAL PRODUCTIVITY
TRUCK, RAIL, DOMESTIC AIR FREIGHTER SERVICE

1969

	(\$Billion) <u>Operating Revenue</u>	(\$Billion) Net Investment in Operating <u>Property</u>	Ratio Revenue to Net Investment in <u>Operating Property</u>
Class I & II Truck	\$ 7.339	\$ 1.670	4.39
Class I Rail	11.451	27.734	.413
American Airlines	\$.053	\$.098	.541
TWA	.032	.045	.711
United	.070	.114	.614
Flying Tiger	.022	.043	.512

Sources:

American Trucking Association, Trucking Trends.

The American Railroad Industry, A Prospectus (ASTRO), 1970,

CAB, Form 242.

Slide 7

PERCENTAGE CHANGE FROM PREVIOUS YEAR
SELECTED OPERATING AND FINANCIAL STATISTICS - STUDY CARRIERS
SCHEDULED ALL CARGO SERVICE 1966-1969

<u>Carrier & Year</u>		<u>Capacity</u>	<u>Traffic</u>	<u>Oper. Revenue</u>	<u>Oper. Expenses</u>	<u>Profit Before Tax</u>
American	1966	+65%	+57%	+53%	+43%	+251%
	1967	17	5	- 5	4	- 73
	1968	29	25	29	32	- 75
	1969	4	- 4	- 2	4	NM
United	1966	+27%	+35%	+48%	+31%	NM
	1967	65	63	53	48	NM
	1968	49	37	25	28	-41
	1969	37	24	25	38	NM
Trans World	1966	+ 4%	+15%	+19%	+15%	NM
	1967	71	47	38	42	NM
	1968	23	23	23	16	NM
	1969	12	13	17	22	NM
Flying Tiger	1966	+31%	+33%	+36%	+21%	+763%
	1967	9	- 4	- 8	15	NM
	1968	7	2	- 1	6	NM
	1969	18	5	5	2	NM

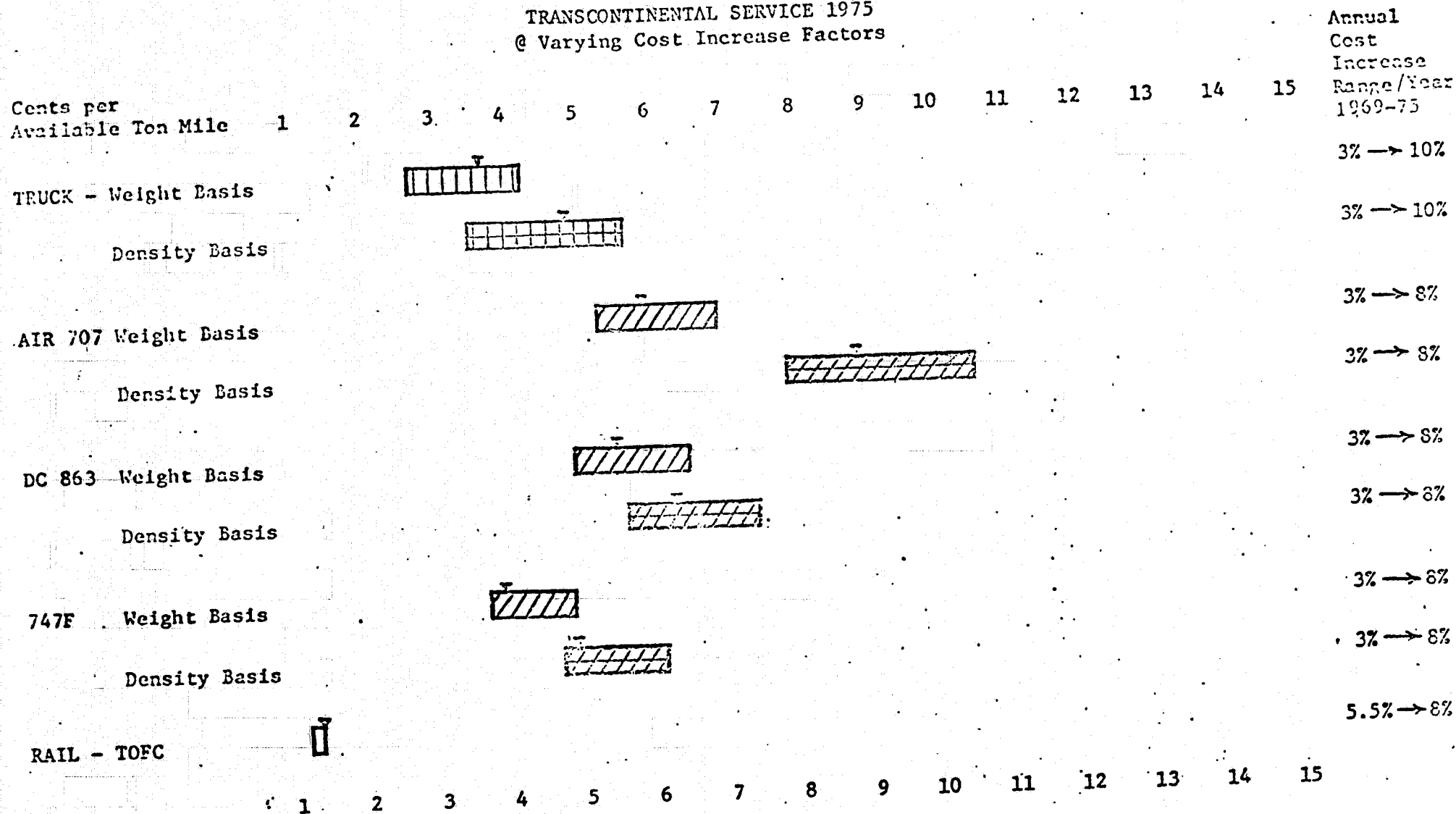
Note: All percentages are rounded to the nearest percent.

American Strike 27 Feb. - 19 March 1969.
TWA and United on strike 43 days in 1966.

NM: Not Meaningful

COMPARATIVE LINE HAUL COSTS per AVAILABLE TON MILE
AIR * TRUCK * TOFC

TRANSCONTINENTAL SERVICE 1975
@ Varying Cost Increase Factors



- Notes:
- Air Density Costs are based on Cargo with on-board densities of 8.6 lbs./cubic foot.
 - Truck Density Costs are based on Cargo with on-board densities of 15.3 lbs./cubic foot.
 - Rail Costs are based on Cargo with on-board densities of 14.6 lbs./cubic foot.
 - Indicates most likely value in 1975.

REVENUE PRODUCTIVITY OF FREIGHTER AIRCRAFT COMPARED TO ORIGINAL COST

Type of Aircraft	Orig. Cost	Year of Orig. Cost	Mil. ATM/Year	REVENUE POTENTIAL 100% Load Factor at Yield/Rev. Ton Mile			RATIO Revenue Potential to Original Cost - 100 Load Factor		
				20¢	15¢	12¢	20¢	15¢	12¢
DC-7F	\$2.6	1956-59	8.2	\$1.64	\$1.23	\$.98	.54	.47	.38
L 1049 C	2.0	1955	4.5	.90	.68	.54	.45	.34	.27
CL-44 D	3.8	1960	28.8	5.76	4.32	3.46	1.52	1.14	.91
707-320 C	7.0	1963	58.1	11.62	8.72	6.97	1.66	1.25	1.00
DC-8F	6.5	1962	55.7	11.14	8.36	6.68	1.71	1.29	1.03
DC8-63	8.8	1966	87.8	17.56	13.17	10.54	2.01	1.51	1.20
B 747F	19.0	1970	231.3	46.26	34.70	27.76	2.44	1.83	1.46
L-500	21.5	1970 EST	234.7	46.94	35.20	28.16	2.18	1.64	1.31

Notes:

Aircraft original cost data from Lloyd's, Aircraft Types and Prices (1970).
Costs do not include allowance for spares.
Available ton miles/year derived from several published sources,

Not Meaningful

- 23 -
- 24 -
slide 9

REVENUE PRODUCTIVITY OF FREIGHTER AIRCRAFT
slide 10
COMPARED TO ORIGINAL COST
RANGE OF LINE HAUL + TERMINAL
OUT OF POCKET COSTS / REVENUE TON MILE

RATIO Revenue Potential to Original Cost 100 Load Factor			SURFACE vs. AIR TRANSPORTATION REVENUE POTENTIAL 100% Load Factor at Yield/Rev. Ton Mile			Year of Orig. Cost	Orig. Cost	Type of Aircraft Total
15c	15c	20c	15c	15c	20c			
38.	47.	54.	28.	28.	21.00	1952-53	2.56	DC-7E
27.	34.	42.	24.	28.	22.40	1952	3.64	DC-7E
19.	1.14	1.22	2.46	4.32	2.76	1960	3.8	CL-44 D
1.00	1.00	1.00	1.17	1.38	1.12	1963	1.51-1.78	707-320 C
1.03	1.29	1.71	6.08	8.36	11.14	1962	6.2	DC-8E
1.20	1.21	2.01	10.24	13.17	17.26	1966	8.0	DC-8-63
1.46	1.83	2.44	27.76	34.70	46.22	1970	19.0	747E
1.31	1.44	2.18	28.16	32.20	46.94	1970	21.2	747E
747			3.70-4.92			1970	4.70-6.92	747E

Notes:

Aircraft original cost data from Lloyd's, Aircraft Types and Prices (1970).

* Truck + Air based on 100% load factor (weight basis).
Costs do not include allowance for spares.
Available ton miles/year derived from several published sources.
Rail based on 70,000 lb. shipments.

** Rail Terminal excludes platform handling
Air Terminal includes only traffic service expense.

AN APPLICATION OF A MARKETING MATRIX TO AIR FREIGHT

<u>Needs of the Customer</u>	<u>Nature of the Traffic</u>		
	Emergency (Unplanned)	Routine Perishable (Planned)	Routine Surface Divertible (Planned)
	(Entries indicate degree of significance)		
Costs	Low	Medium	High
Airline or Trucker Pick Up & Delivery	Medium Customer Delivers	High	High
Speed	High	High	Medium
Tracing	Low - It can't afford to get lost	Low - It can't afford to get lost	High
Territorial Coverage by Individual Airline	Low	Medium	High - Wants full coverage
Availability of : Capacity from Specific Airline	Medium - Usually space for emergencies	High	High
Information on "Total Cost Approach"	Low	Low	High
Responsiveness of Total System	High	High	Medium
<u>Response by the Airline</u>	(Entries indicate nature of policy)		
Pricing	High	Medium	Low
Type of Equipment for Shipment	Belly	Belly or Freighter	Freighter
Personal Selling	Social*	Social- Technical	Technical*
Schedules	Passenger	Passenger or Evening Freighter	Evening Freighter
Promotion	Schedules and Service Area	Schedules, Price and Markets	Total Cost or Profit Analysis

* Social skills include maintaining favorable image, supplying simple information etc.
 Technical skills include training in logistics analysis, knowledge of competitive

STRATEGIC ALTERNATIVES FACING THE U. S. DOMESTIC AIR FREIGHT INDUSTRY

<u>Nature of Strategic Decision</u>			<u>Measurement</u>
1. Carriers of loose packages	Versus	Carriers of containerized freight	1. Percent of shipments and tonnage that is containerized
2. Carriers handling a wide range of general commodities	Versus	Carriers specializing in particular kinds of traffic	2. The percentage distribution of tonnage and revenue by commodity
3. Carriers generating growth from air oriented commodities	Versus	Carriers diverting commodities from surface transportation	3. Percentage of shipments and revenue which is emergency, planned perishable and routine surface divertible
4. Carriers who view freight as a byproduct of the passenger business	Versus	Carriers who view freight as a primary activity	4. Percentage of traffic carried on freighters and pricing policy based on freighter or combination service
5. Carriers offering scheduled service	Versus	Carriers specializing in non-scheduled service	5. Percentage of flights which are scheduled
6. Carriers with direct customer contact	Versus	Carriers dealing through intermediaries	6. Nature of marketing expenses
7. Carriers offering line haul service only	Versus	Carriers offering door-to-door service	7. Percentage of shipments handled door-to-door
8. Carriers only in the transportation business	Versus	Logistics companies both transporting and storing goods	8. Percentage of operating revenue generated from transportation
9. Carriers with the capability of intermodal operations using rectangular containers	Versus	Carriers utilizing a containerized technology unique to the airline industry	9. Investment in "jumbo" freighters plus percentage of shipments, tonnage and revenue associated with rectangular containers
10. Carriers experiencing high growth rates e.g. 15%-20% per year	Versus	Carriers experiencing growth rates more typical of the transportation industry e.g. 4%-8% per year	10. Growth rates of shipments, tonnage and revenue
11. Carriers willing to bear losses pending the development of a new generation of aircraft	Versus	Carriers that price realistically	11. The use of "profitability load factors," operating ratio and ROI data

FOOTNOTES

- ¹ E.W. Eckard, Air Cargo Growth Study MRS-49, Marietta, Lockheed-Georgia, 1965, p. 63 and McDonnell-Douglas, Advanced Cargo Systems Report C1-801-1610-1, Long Beach, 1969, p. 27. The reader should be aware of the distinction between freighter planes and "all-cargo" airlines. Freighter planes are aircraft which carry freight only as contrasted with combination aircraft which carry passengers and belly cargo. Freighter planes are operated by the combination and all-cargo carriers. The all-cargo carriers, including Flying Tiger, Seaboard World, and Airlift International, provide scheduled certificated all-cargo service in freighter planes, as well as passenger and freight service under charter.
- ² In view of the fact that there is vigorous debate as to the true profitability of belly cargo (see Frank M. Lewis, "Is Belly Freight Profitable?", Transportation Research Forum Proceedings Twelfth Annual Meeting, Oxford, Richard Cross, 1971), the domestic freighter losses raise questions as to the over-all profitability of U.S. domestic air freight. On the other hand, there are also disagreements as to the validity of the CAB formula for costing freighter service. But in the absence of other published data, it must be assumed that despite a variety of strategies, airline managers have not succeeded in producing substantial profits from freighters, and perhaps even from total air freight.
- ³ "Airline Economist Gloomy on Cargo Traffic Growth: Sees Passenger Upturn", Traffic World, June 21, 1971, p. 16.
- ⁴ Irving Saginor and David B. Richards, Forecast of Scheduled Domestic Air Cargo for the 50 States, 1971-1975, Washington, CAB, 1971.
- ⁵ International Air Transport Association, IATA Financial and Economic Studies Subcommittee, Economics of Air Cargo Carriage and Service, Montreal, by the Association, 1969, pp. 26,35.
- ⁶ Within the past few years, several major truckers and railroads have been granted authorization to experiment as air freight forwarders and two air freight forwarders have been permitted to operate as surface forwarders when carrying traffic having a prior or subsequent movement by air (see 339 ICC 17).
- ⁷ Perhaps a reconstituted Airlift International could serve as the nucleus for the strong all-cargo competitor to Flying Tiger.
- ⁸ For a summary of a study of transcontinental container trains linking a national warehouse system see, Jack W. Farrell, "Domestic Containerization - A Possible Breakthrough?", Traffic Management, July, 1971, pp. 55-57.

N73-32883

TRENDS IN COMMUTER AIR CARRIER OPERATIONS

by William Swan
M. I. T.

July 13, 1972

Abstract

Commuter air carriers operate in what approaches a free market environment. Unlimited market entry is permitted, and there is no chance for subsidy. The commuters are transitioning from scheduled air taxi services to miniature local service airline operations. There is pressure for relaxing capacity and weight limitations so that markets inherited from the regional carriers can be profitably served. Profits are sought in longer hauls and denser markets.

When serving the low-density markets, the cost of establishing successful routes and purchasing aircraft severely tries the capital resources of these small corporations. The traditional business oriented feeder operations involve services over less than 200 miles with very small aircraft. Costs must be cut to the bone.

1. The Market for Commuter Air Service

Commuter air carriers serve short haul low density air transportation needs. In 1971 they carried 3% of the domestic passenger trips while generating .33% of the passenger miles. The average length for a commuter passenger trip is only 90 miles. For the trunk airlines this figure is 800 miles.

Commuters today provide air service to approximately 200 cities that would otherwise do without. They carry mail and freight as well as passengers.

90% of the commuter business is under 200 miles. This short haul market is difficult for air transportation. At short trip lengths the cost of initiating the journey - the cost of ticketing, boarding, baggage handling, and taking-off - dominates the economics. Neither cruise speed nor cost per mile is as important as per trip costs.

The other important item in short haul travel is the schedule since nobody is going to wait two hours for a half hour flight. Thus the frequency of service must be high.

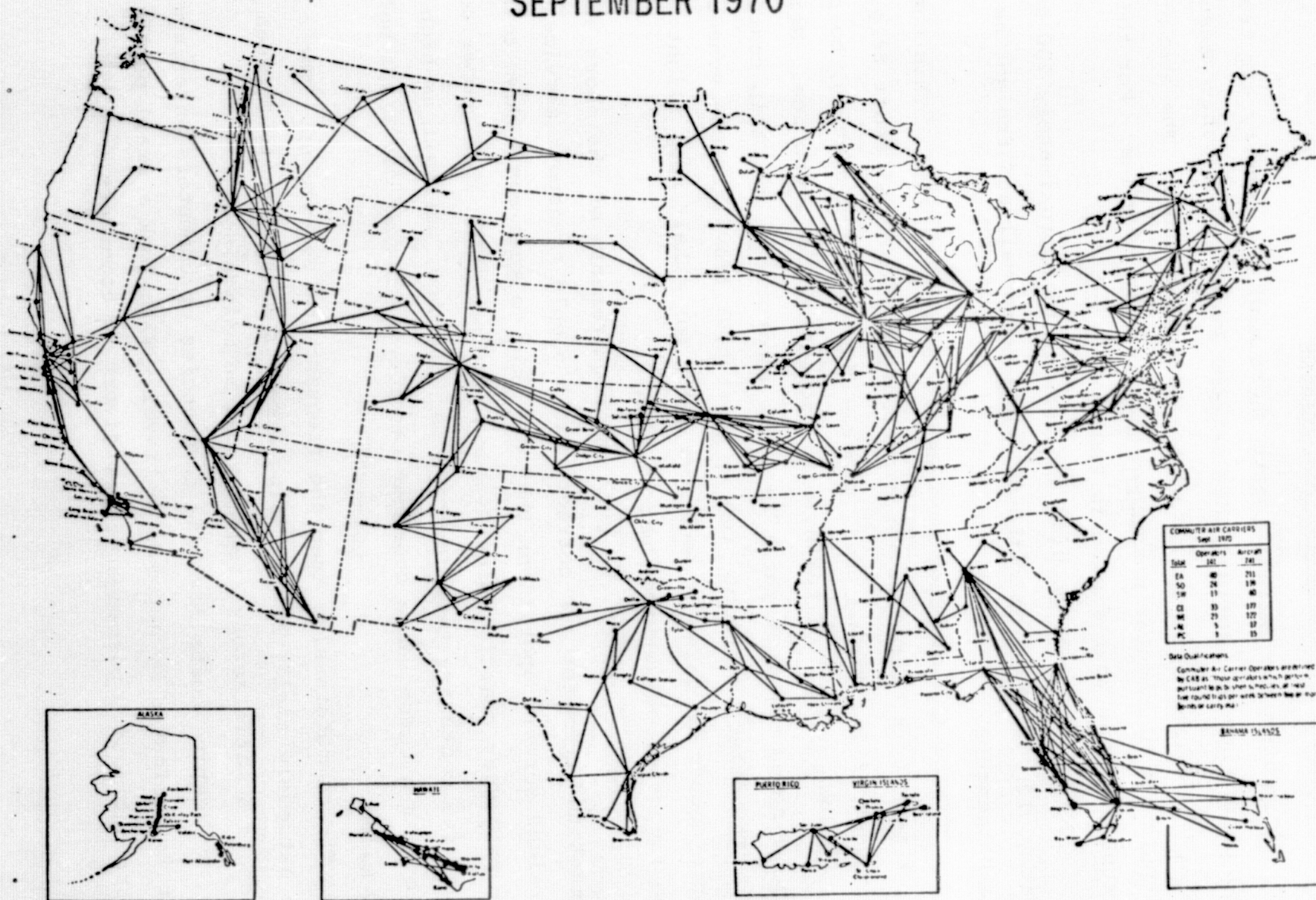
In order to match the ruthless requirements of the short haul market the commuter air carriers run a simple transport service. By straight forward operations they are able to keep costs down to \$5.50 per passenger boarding plus 9¢ per passenger mile. For comparison trunkline costs are twice as high per boarding, but half as high per mile. As a consequence commuter service is cheaper for trips under 150 miles.

The commuters also keep the frequency of service up. Their markets are extremely small, but by using aircraft with capacity between 5 and 19 seats a satisfactory frequency can be maintained.

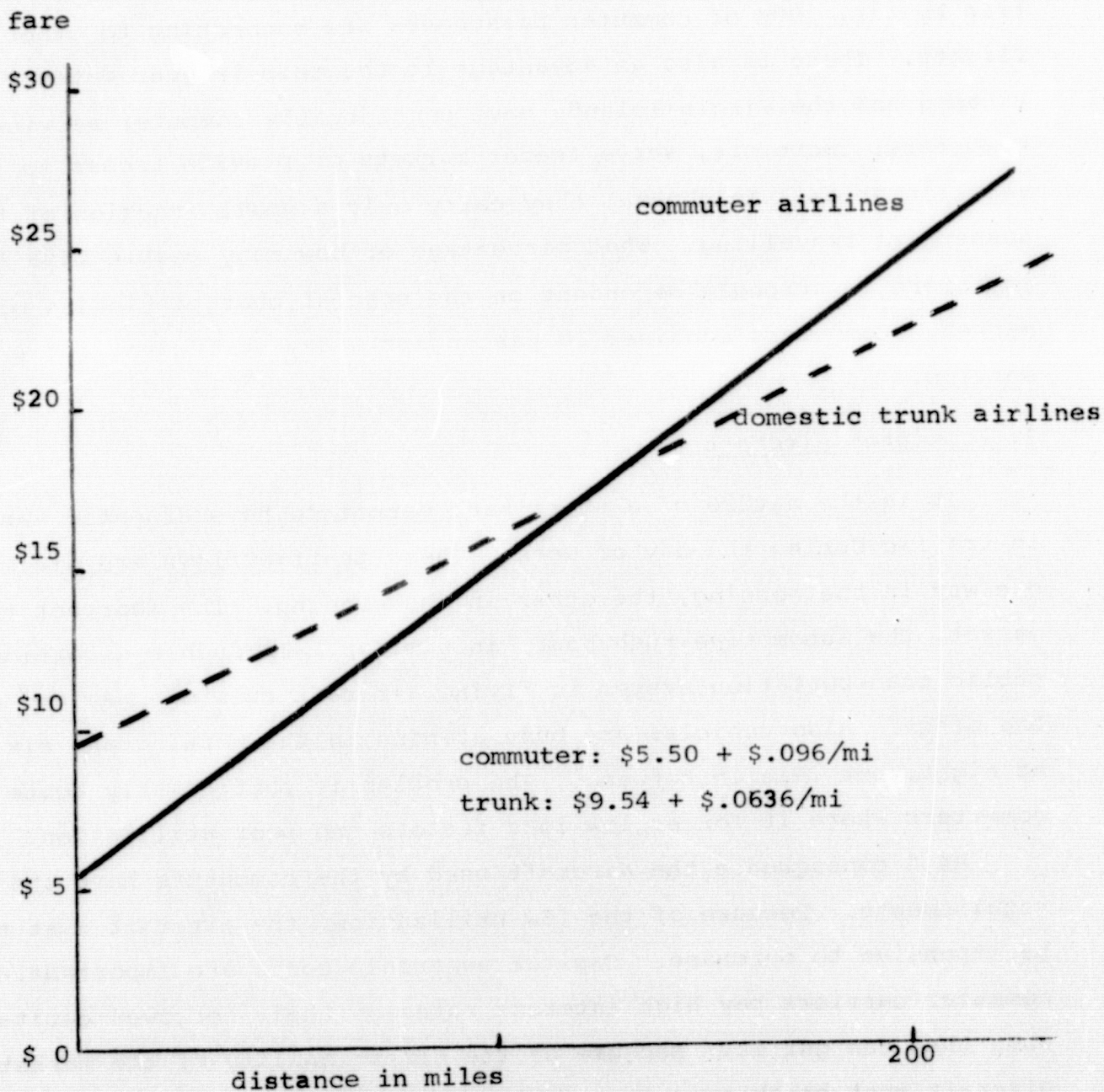
By keeping costs down and frequencies up commuters enter a market that is dominated by automobile travel. With luck a small percentage of the automotive passenger flows divert to commuters.

COMMUTER AIR CARRIER ROUTES

SEPTEMBER 1970



FARE STRUCTURES FOR COMMUTER AIRLINES AND TRUNKS



This is particularly likely if the passenger is making a longer trip by air. 80% of commuter passengers are connecting to other flights. There is also an advantage if the trip is over water; the Bahamas and the Virgin Islands have considerable commuter service. Commuters, therefore, serve feeder markets or provide access to remote vacation areas. In general they carry only a small fraction of the passengers travelling. What percentage or how many people ride the commuters is strongly dependent on the special characteristics of each market. Commuters consider 20 passengers a day sufficient for profitable service.

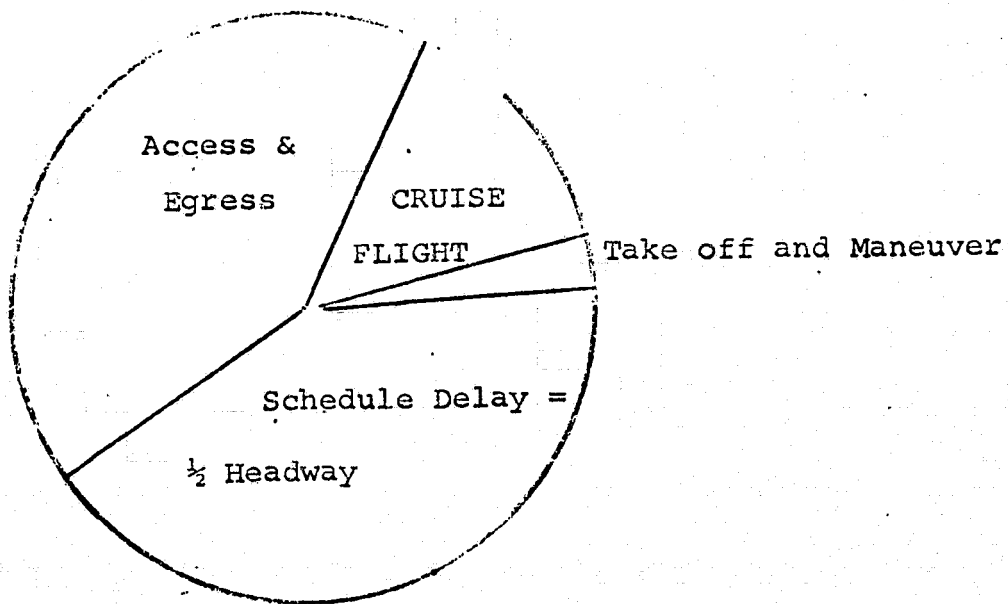
2. Commuter Aircraft

It is the nature of a short haul market to have dramatic variations in traffic during the day or week. These traffic flows are directional - one way in the morning, the other in the evening. The shortest travel market, the automotive rush hour, is similar. In such a situation a public transportation system is flying aircraft full one way and empty the other. Also vehicles are busy at nine in the morning and six at night, but idle in between. The problem is particularly acute for commuters where it forces low load factors and poor utilization.

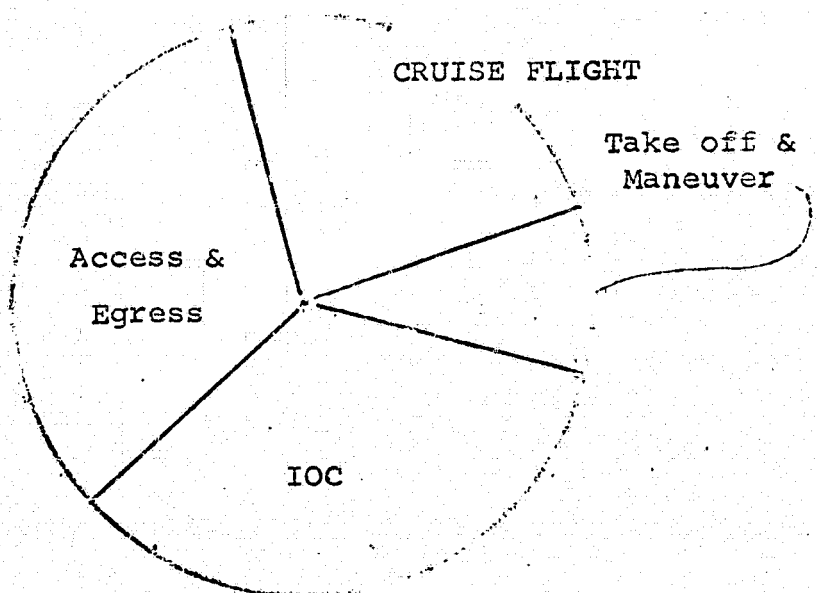
As a consequence the aircraft used by the commuters have special requirements. Because of the low utilization, the aircraft must not be expensive to purchase. Capital ownership costs are important. The commuter carriers pay high interest rates on their borrowed capital, when they can get it. Because of the directionality of the market the aircraft must break even at very low load factors. The cost of flying around empty must be low.

In exchange for these two requirements commuter aircraft operations are not so sensitive to speed or DOC (Direct Operating Costs) in cruise. Short trips are made at low altitudes, so there is little need for pressurization. Nor is cabin comfort as important as it is on longer rides.

Trip Time for a Short Haul Trip



Trip Cost for a Short Haul Trip



A number of light twin aircraft are used by the commuters. Four of the most popular made today top the list in table 1. The sleekest is the Beech 99 with retractable gear and a high cruise speed. The other work horse is the DeHavilland Twin Otter. This aircraft has fixed landing gear and a high wing with struts. Nevertheless it is quite successful for short haul air operations the world over. For comparison table 1 also includes a variety of larger and more modern aircraft designed for the same short haul air market.

Since financing is difficult to find, the commuter carriers, like under-capitalized countries, prefer used aircraft to expensive new ones. In the short haul market, cost means more than time.

3. The Commuter Air Carrier Industry Today

There are between 100 and 150 commuter air carriers in existence today. In January of 1962 there were only 12 companies carrying mail or offering more than 5 round trips per week between two cities. The growth of the industry in recent times has produced 50 more or less permanent corporations who today do 90% of the commuter business. The remaining 50 to 100 companies are air taxi operators who get in and out of the commuter business as time and fortune permit.

This transience, which seems strange to the air carrier industry as a whole, is encouraged by the unregulated nature of the commuter industry. The commuters operate in a free market with unlimited route entry and exit and no fare regulation. They file little or no information with the Civil Aeronautics Board (CAB) or anyone else, and in no way can they receive federal subsidy. The only rule is the 12,500 lb. weight limit.

This weight limit allows commuters to operate without CAB certification with any aircraft under 12,500 lbs. gross weight. This limit also coincides with a break even point in the Federal Aviation

	<u>seats</u>	<u>cost</u> <u>(000)</u>	<u>speed</u>	<u>range</u>	<u>gross wt.</u>	<u>in use '71</u>
Piper Aztec	5	\$ 113	210mph	700mi	5,200lbs	74
Cessna 402	9	\$ 150	190	700	6,300	37
Beech 99	15	\$ 455	284	500	10,400	82
Twin Otter	19	\$ 550	210	700	12,500	51
Swearingen Metro	19	\$ 600	390	500	12,500	0 (+2)
DC-3	25	\$ 40	190	1500	24,500	5 (+3)
Falcon 20T	32	\$2400	520	854	30,865	0
YAK-40	32	\$1500	342	1000	35,300	0
VFW 614	40	\$3000	450	400	41,000	0
Convair 440	44	\$ 50	289	1300	48,000	3 (+2)
F-28	70	\$4000	510	510	65,000	0
B727-200	163	\$8500	568	1300	180,000	0
DHC-7	48	\$2000	280	1280	38,500	0

TABLE 1 SOME AIRCRAFT FOR THE COMMUTER MARKETS

Administration (FAA) definition of equipment and pilot requirements.

The freedom from constraint when operating small aircraft dates back to 1952. It was felt that the air taxi operators should be given the freedom to seek out new markets or to serve markets of small profitability to the airlines. The lack of control over routes and prices was essential to such experimental activities. These activities strengthened the overall air industry. The weight limit served to restrict air taxi operations to equipment noticeably less magnificent than the standard local service airliner, the DC-3.

For a period of 15 years the third level air carriers either made it or went broke operating feeder service from smaller cities and providing access to remote areas for vacation travel. For the most part, these were small operations associated with a fixed base operator. These mama papa airlines were called scheduled air taxis.

In the last four years the picture has changed. The commuters still serve the same markets - feeder and vacation access travel - but the air taxis have become miniature airlines.

At present there are three types of commuter air carriers. The most mature are really commuter airlines.

The commuter airlines are in the third level business for good. They do not want the CAB in their lap. They operate a no frills transport service; government paperwork would kill them. "Bus service with an aircraft", one man called it.

Perhaps 30 of the 50 largest commuters fall into this highly professional category. Their managements are aware of the cost structure of air transportation and sensitive to the importance of the frequency and timing of service. They use simple unpressurized aircraft to keep operating costs, particularly time and flight cycle costs, down. Such operations could not support the highest airline comfort

or speed standards. Similarly, viable operations keep boarding and ticketing costs down to \$2 a head. Trunk airlines spend \$7 to \$8.

What these commuter airlines offer is a new style of air travel, a style particularly suited to markets with ground competition: offer a service with emphasis on schedules.

Typically these miniature airlines build a route structure around feeder service to a large metropolitan area. For example, Executive Airlines feeds Boston's Logan International and Golden West feeds Los Angeles and San Francisco airports. The route maps are presented in Figures 1 and 2.

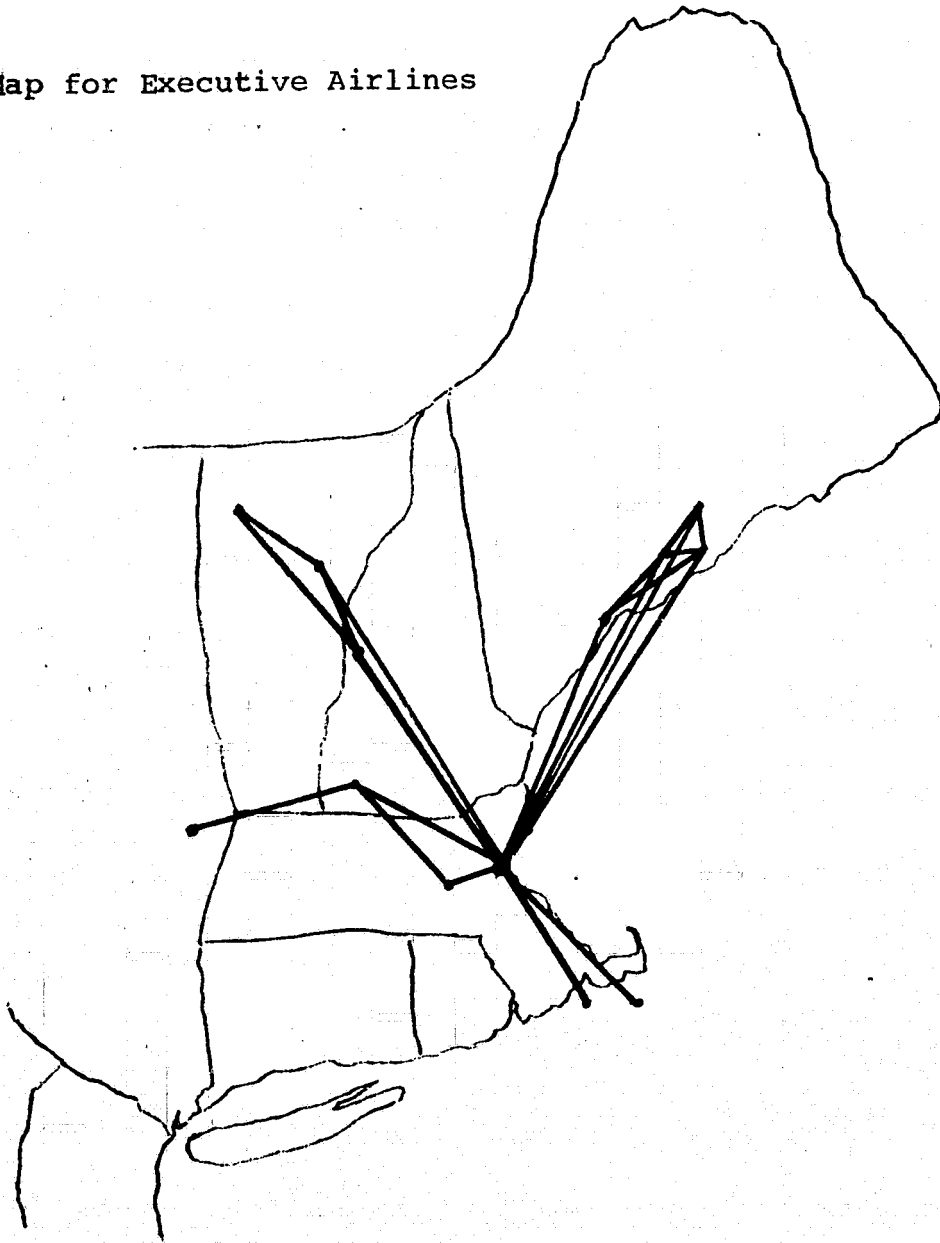
The other half of the large commuter air carriers is on a different tack. These companies want to become certificated air carriers as soon as they can develop their markets enough to justify CAB route awards. Route protection is desired. The commuters can reduce their capital investment and increase their airline image by purchasing used Convair 440's and DC-3's to replace their fleets of smaller light planes.

Operations of this sort can be built on the exploitation of a single market. Usually the market is one which might justify airline service, but which has one or both terminals off the established airline airports. Remember, half of the communities served by commuters receive no certificated service.

For example, Wright Air Lines is making a business out of the downtown Detroit to Cleveland market. In a more developed route network, Joe Mackey is establishing his second airline in the Bahamas, having sold his first to Eastern.

The third and last type of commuter air carrier is the old scheduled air taxi service. In remote areas the 15 seat Beech 99 and the 19 seat DeHavilland Twin Otter are too big and expensive to serve

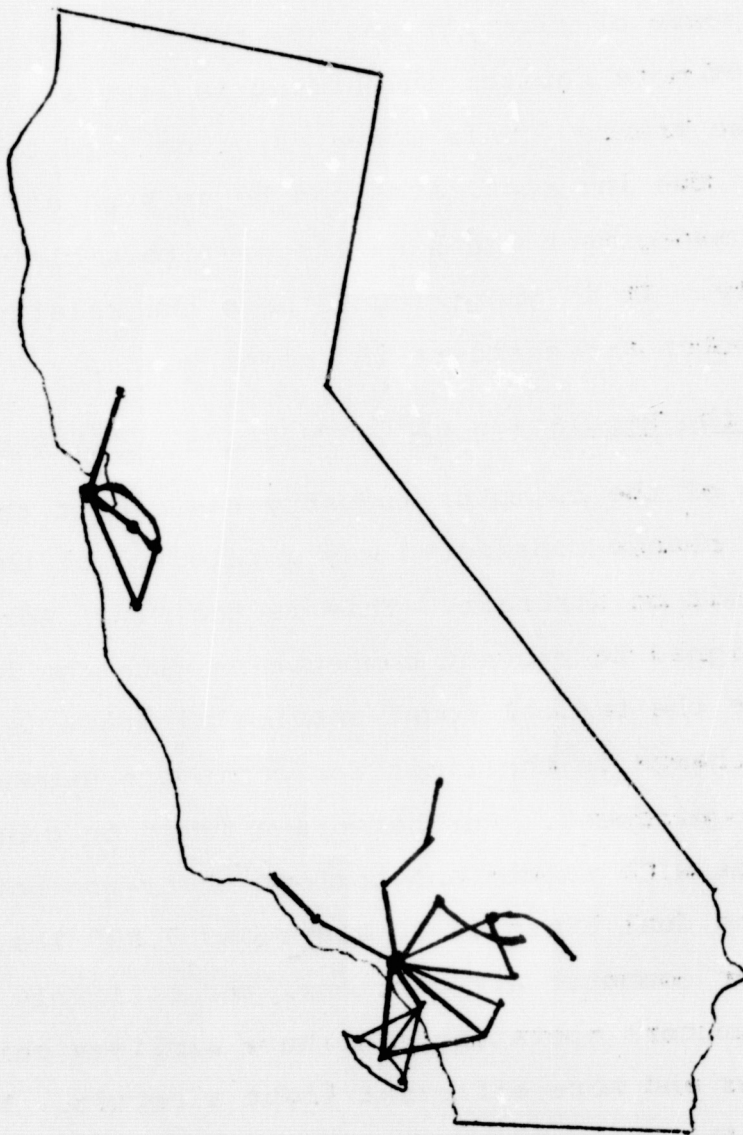
Route Map for Executive Airlines



Source: OAG july '72

FIGURE 1

Route Map for Golden West Airlines



Source: Golden West

FIGURE 2

the thin markets. A five to nine seat aircraft such as the Cessna 402 can be used to ferry passengers to the state capital or other hub. Operations are more economic if combined with charter activities and other services of a fixed base operator or flying service. It is these low density operations which provide politically important links in our national transportation system. They mean a lot to their communities.

All three types of commuter air carriers must borrow to cover the capital expense of aircraft and new routes. In total the commuter industry has 50% more capital investment in aircraft per dollar of revenue than the trunks. This money is often hard to come by. When it is available the interest rates can be as high as 10%. A few months of poor management can have the creditors closing down the service entirely. It is promising to note the relative permanence of the larger commuter air carriers in recent years.

4. Changes in the Regulation of Commuter Air Carriers

The growth of the commuter industry has caught the governmental eye. The first change considered was a relaxing of the 12,500 lbs. gross weight limit on aircraft. This is the Civil Aeronautics Board's restriction designed to prevent competition with the local service carriers. Since the typical local service aircraft is now the 727, not the DC-3, some change in the limit for commuters seemed in order merely to update the requirement. Furthermore a limit on gross weight could force compromises with safety and comfort that were not intended. As a consequence the dual limit of 30 seats and 7,500 lbs. payload has been proposed for commuter air carriers, and is likely to be accepted.

For the commuters operating miniature airlines this will allow the use of larger and more efficient light aircraft. A stretched Twin Otter of 14,000 lbs. has already been talked about. The increase in

capacity is welcome in busy feeder markets where extra sections and back-up aircraft are now used to supplement an already full schedule of departures.

For those commuters aspiring to route certification the move to obsolescent local service airline equipment is envisioned. Since the limit is on seats and cargo weight not aircraft size the smallest pressurized airliners could be converted to luxurious accommodations. These aircraft currently are a tenth the price of a new light plane, so some of the increased DOC is offset by reduced capital charges. Lately the CAB is becoming more open to granting exceptions for the use of DC-3's or Convair 440's in commuter markets.

An increase in the aircraft size limitations has no effect on the smaller air taxi services.

Accompanying the updating of the aircraft the CAB is contemplating increased reporting requirements. In 1969 the commuters began to file simple traffic, aircraft, and schedule information with the Board. There is a possibility that the Board may trade some form of route protection for reporting requirements on finances and costs. Since many of these companies are privately held, this will be the first time much of this information will be known.

Last of all the CAB is experimenting with a form of route subsidy which would impact the smaller operators. The CAB will receive bids for guaranteed service between two points over a period of time. Thus a commuter will offer to serve market A-B four times daily at a fare below \$25. for a yearly subsidy of \$30,000.

While the CAB is readjusting its sights, the FAA has not been idle on the safety issue. Although commuters are four times as safe as other general aviation aircraft, they are still four times as dangerous, in terms of accidents per take off, as the certificated carriers. Perhaps the most relevant statistic is the comparison with

turnpike automotive travel, which has a quarter the fatalities per passenger mile. The FAA is responsible for aircraft safety, and may very well increase pilot and aircraft requirements in the near future.

Particularly likely is a review of pilot qualifications for commuter operation. Pilots with higher qualifications are now generally available at increased expense. Unfortunately the costs of FAA regulations may upset the fragile economics of some carriers.

Safety should automatically improve as the commuters move to 30 seat aircraft, which are more strictly controlled, and as equipment at smaller airports is updated.

5. The Commuter's Relationship to the Regional Air Carriers

Lately there has been a move on the part of the commuter carriers to serve routes and markets that earlier were the realm of the regional carriers. The regional carriers used to be called the local service carriers. The regionals have been buying new and used equipment similar to the trunk lines. As a consequence their shortest and lowest density routes can no longer be served economically. They are willing to abandon these routes to the commuter airlines.

What is happening is a giant game of musical airplanes. The trunk carriers have purchased long range aircraft and opened up nonstop and cross country markets that were previously impossible. Average trip lengths grew by a third during the last twelve years. It is the nature of both airline economics and transportation demand that things get rosier for air service as the distance increases. So the trunk lines were delighted to configure themselves to serve longer haul markets.

Meanwhile the local service airlines were busy buying intermediate range aircraft from the trunks. The used aircraft were well suited to the higher densities being experienced in the growing air transportation markets. The local service carriers became the "regionals" and found that they could not serve the thin markets without subsidy. Markets

that would have outgrown subsidy if served by DC-3's could not be profitable using 727's. From 1952 to 1970, 418 points were eliminated from certificated air carriers routes.

Within the last five years the motion at the head of the snake has reached the tail. Air taxi operators, people who had an image of being tied to one or two routes using the part time services of an owner pilot, have moved from 9 to 19 passenger aircraft. They now offer reliable service over a route network using a fleet of aircraft. Once again profits were found in longer haul higher density routes.

The commuters found a fruitful market replacing subsidized regional carrier activity.

The Allegheny Commuters are the most highly developed example of this activity. Eight commuters serve sixteen markets on Allegheny's behalf. This is how the system works: Allegheny wishes to abandon a route it is serving at the minimum level allowed by the CAB, two flights a day. In spite of the subsidy Allegheny is carrying a loss for the operations. A contract is made with one of the local air taxi or commuter operators to replace the airline service. The commuter receives a ten year contract. Allegheny provides ticketing and reservation services as well as gate service at the major airports. The commuter flies Allegheny's colors. He also flies aircraft approved by Allegheny - often Beech 99's. The commuter gains a market, a public identity, and a permanence that permits financing. Allegheny gains reduced losses plus a high number of transfer passengers. The CAB does not have to pay out subsidy. And finally in all cases both frequency and reliability of service to the outlying community improves.

The corner cutting abilities of a small operator are combined with the network of a larger carrier very effectively. Attempts by regional carriers to duplicate commuter operations are normally hindered by

stringent FAA, CAB, and union controls over certificated operations.

Other airlines have been substituting commuters with less formality. For instance Northeast Airlines was able to give away a number of routes to Executive Airlines. The CAB permits the substitution as long as Northeast guarantees continued service should the commuter fail. At least 27 commuters have been involved in direct substitution for regional air service. Some 86 markets have been involved. It has been this activity, generally successful on all sides, that has moved the CAB to replace the current subsidy pattern with putting routes out on bid to the commuters.

6. Summary

The commuters are moving from a period of experimental market exploration by small air services to a larger more permanent operation tailored for the ruthless requirements of a low density short haul market. They operate increasing numbers of feeder services to large airport hubs. Some are sticking to no nonsense operations within the institutional structure of the CAB and FAA requirements. Others are trying to grow into certificated airlines. A constant activity of smaller companies still provide vital air links to remote communities.

The vehicle limitation on gross weight will probably be raised and the monitoring and reporting by both the FAA and the CAB increased as the commuters' activities grow in importance.

The commuters are moving to take over the smaller subsidized and unsubsidized markets previously served by the regional carriers.

N73-3288-6

REMARKS OF MONTE LAZARUS
at the
MIT/NASA SUMMER WORKSHOP
WATERVILLE VALLEY, MASSACHUSETTS

July 13, 1972

When the Congress created the Civil Aeronautics Board in 1938, it gave the new creature a series of statutory duties. One of these was to encourage and develop ". . . an air transportation system properly adapted to the present and future needs of the foreign and domestic commerce of the United States. . . ." Under that mandate, the Board has attempted to meet the problem of providing air service to smaller communities at reasonable cost to the taxpayer. Over the years, the traditional approach has been to subsidize certificated carriers for their services to these uneconomic points. The system generally has worked well, and many small towns have air service which would probably not otherwise exist. This is a proper national expenditure, in our view. In many cases, air transportation is a key to economic survival of the communities.

But, in the last few years the traditional method of supporting marginal services does not seem to be working as well as in the past. The subsidy bill has been increasing as small community services have declined.

Throughout the late '60's, the subsidy bill had been going steadily down under the class rate formula then in effect. That only tightened the vise. As the subsidy bill went down (because of the mechanical application of the subsidy formula), the actual need went up. Then the

Board began receiving complaints from the communities and members of Congress. Something had to be done. The locals were beginning to feel the effects of the traffic fall-off. Their new large equipment was flying with more and more empty seats. In an attempt to cut costs, and relieve a pretty desperate situation, the carriers naturally reduced their most marginal services. They either cut back to a bare minimum, or suspended service completely. In some cases, they were able to develop substitute services in conjunction with commuter carriers. Mergers followed. They are products of bad times, and are symptoms, not answers.

In December of 1969, the Chairman asked the staff to put together a top-to-bottom study, with recommendations on how best to deal with the problem of service to small communities. Before the Senate Commerce Committee in May 1970, the Chairman testified about the worsening problem. He outlined the alternatives which the Board would be exploring. The idea was to consider all the possibilities -- including some that could completely scrap the existing system. We considered six alternatives:

1. Changing or abandoning the subsidy class rate;
2. Seeking a subsidy increase;
3. Implementing a non-Federal subsidy program;
4. Subsidizing air taxi operators;
5. Instituting a contract bid system;
6. Doing nothing.

Simply changing or abandoning the subsidy class rate, or increasing subsidy funds does not get to the fundamental problem of the inability of the certificated carriers to meet small community needs. A non-Federal subsidy program has obvious financial problems. Doing nothing, of course, leaves us in the unsatisfactory position we're in now. Direct subsidy of air taxi operators would probably be the prelude to an expansion of that system without really focusing on matching service to needs.

We found that the greatest promise for better service at a reasonable cost to the taxpayer seems to be in a new approach -- the contract bid system. This is a major new departure from the usual Board licensing procedures. It is embraced in the bill which the Board put before Congress, for a three-year experimental authorization, and is now pending before the Senate in S. 3460. Let's examine the background for a clear understanding of the Board's proposal.

The Changing System

The local service carriers were given certificates in the '40's and '50's to provide feeder service linking the small communities of a region to central hub points. Over the earlier years they generally responded very well to the needs of the system. But, air transportation is dynamic, and changes have taken place. We're all familiar with those changes.

First, the local service carriers have been transformed into small regional trunklines. Most of their passenger miles are flown on subsidy-ineligible routes between the larger cities of a region. Their smallest aircraft are at least double the size of the 21-seat DC-3's they began

with. And they have fleets of jets seating up to 120 persons each. Finally, for a variety of reasons, the local service carriers have focused their energies on the needs of their higher density markets. The result has been that the carriers' services to their smaller points have become less responsive to the needs of those communities, even while the carriers' subsidy demands have increased substantially.

No one's to blame for the situation. Yet everyone's to blame. Everyone concerned, including the Board, has had a hand in leading us to our present position. The carriers wanted to expand their systems, and to move on to larger, more sophisticated equipment. The Board gave them the route structures to support big jets. As a result, the carriers originally chosen to provide local service to small communities no longer have the best equipment for the job, and are turning their interests elsewhere. This inevitably shows up in diminished service to small communities, and in increasingly high costs.

The second major change since the certification of the local service carriers has been the vast growth of the air taxi and commuter air carrier industry. A major factor here has been the development of efficient, light-weight turboprop aircraft than can seat up to 19 passengers. Under Board regulations, aircraft weighing less than 12,500 pounds can be operated in common carrier air service without a certificate of public convenience and necessity. The combination of that regulation, plus the new lightweight aircraft, has virtually created a whole new class of

carriers. They are unsubsidized. They are not protected in any way from competition by other carriers. They can often provide short-haul service to small communities a lot more cheaply than can certificated carriers.

In a large number of short-haul markets, air taxis and commuters compete successfully with the certificated carriers, including subsidized local service carriers. In addition, commuter carriers now operate scheduled service to over 200 points small enough for certificated carriers either to have given them up or never to have asked to serve them in the first place.

The third change is the expansion and improvement of the nation's highway system during the '60's. In this country, as nowhere else on earth, the private automobile has become the principal means of short-haul transportation.

The fourth, and very significant change, has been the shift of population in rural America, in the plains and mountain states. These areas need good air transportation. In many cases, it is virtually a matter of economic and social survival. What significant industry would locate in an area without good air service? How can we prevent the continuing exodus to the overcrowded cities unless there is a sound economic base, supported by air transportation, to encourage people not to move to the cities? As a matter of national policy, we think these considerations should weigh heavily.

We believe a contract bid system could deal with the changed system. It would have a number of important advantages over the current system:

1. It would be more responsive to changing local needs than the present approach;
2. It would more directly relate Federal payments to a particular community's air services than the present approach;
3. It could be provided at substantially less cost to the taxpayer, without placing a large new burden on the fare-paying passenger;
4. It would automatically adjust to take account of changing carrier interests and technological improvements;
5. It would go far to insure that the carrier with the most appropriate equipment, experience, and ability is selected to meet the community's needs. It would probably result in greater carrier identification with the small community.

The Experiment

In rough outline, here's how the experiment would work. After receiving the views of interested communities, state authorities, and so on, in each of several geographical areas the Board would select a number of communities to receive the experimental air service by contract. Our current thinking is that we'll have to try the experiment in at least three different areas, with varying economic and geographical features. Necessarily, this will mean some picking and choosing. It's a limited experiment we're talking about. Once the communities were selected, the Board would specify the kind of air service it would support. That would include the maximum fare level, the minimum number of flights, and minimum aircraft capacity. Interested parties -- who could include air

taxi operators as well as certificated carriers -- would be invited to submit bids showing how large a Federal payment they would require to provide the service. The lowest bidders would be selected, provided they were found to be able to provide safe and reliable service. Contracts would run for no more than three years, and the existing contractor would have no greater rights than anyone else to bid on a follow-on contract. Finally, renegotiation of the contract price would be expressly precluded, except to take account of increased costs attributable to governmental actions.

A contract could not be awarded until the Board determined that the carrier was capable of meeting all the requirements of the FAA and the Board as to safety and reliability of operations. We're not interested in buying cheap service at the expense of safety. Marginal operators would be kept out.

In terms of funding, the bill would authorize appropriations of \$2,000,000 per year. That level was selected for several reasons: One is that it is large enough to enable the Board to try out the contract method of air service in a number of diverse geographical areas of the country. A second is that until the Board and air carrier industry become familiar with the contract process, it will be difficult to estimate accurately what contract prices will actually be bid.

Air service by contract program should not increase the total Federal outlay for support of small community air service. In fact, the odds are

that the contract program would result in a decrease of Federal expenditures. Our staff studies indicate that, particularly at the local service carriers' smaller points, replacement of certificated subsidized service by commuter carrier operations under a contract could result in some very substantial savings.

For illustrative purposes, the Board's staff analyzed the likely difference in Federal costs between subsidized operations by a local service carrier, on the one hand, and contract operations by a commuter carrier, on the other, at six small communities in Colorado, Kansas, New Mexico and South Dakota. The analysis indicates that at those six points, alone, the Government could save over a half-million dollars per year by using the contract method.

However, we're not talking about saving Federal money by imposing substandard air transportation on small communities. On the contrary, we think that the contract approach would lead to air service more in keeping with what small communities need and want. Admittedly, air service by contract would be on a no-frills basis. A Twin Otter or Beech 99, for instance, isn't as big or as comfortable as a Convair 580 or Fairchild F-227. But they're reliable, suited for smaller airports, and capable of being operated at lower costs than larger aircraft. More importantly, we think that in most instances carriers providing air service by contract would operate more flight frequencies on schedules better attuned to community travel patterns. This has been our experience with replacement

services now in progress. On the short-hops, which are characteristic of small community service, more flights at better times are likely to outweigh the extra comforts of large aircraft service. That's probably a major reason why traffic has increased in markets where certificated carriers have been replaced by third level carriers.

It is important to recognize that the proposal has close relatives throughout the existing small community air transportation system. For instance, at a variety of points, air taxi and commuter carriers are today providing air service under contract with certificated carriers or with Government agencies. The Board's proposal, in other words, is an evolutionary one that is based, to a significant extent, on present day experiences and practices.

What Next?

We have had one hearing before the Senate Commerce Committee on our proposal. Our bill is pending there, but no action has yet been taken on the House side. We have the general support of the Office of Management and Budget and the Department of Transportation for our proposed experiment.

Criticism of our proposal has been fairly light. There is some concern over safety of small aircraft. But we have specifically provided that the operators must meet FAA safety standards to qualify as bidders. Some of the commuter carriers insist that route protection is necessary to insure success. We feel differently. Any successful bidder has an automatic advantage by reason of the financial support he gets. Obviously,

at marginal points, which cannot even support one carrier, this is an overwhelming advantage. Furthermore, route protection and vested rights simply take away the incentive to match service to needs in this kind of proposal. Finally, some local service carriers may feel that the contract system would deprive them of necessary subsidy funds. Our answer to that is that the impact would be very minimal. The proposal itself is for a limited experiment, costing about \$2 million a year in total. Even if the system were expanded, though, the overall impact would be fairly small. But the most important point is that, to the extent the current system has flaws, we should try a new and possibly better approach. In short, the time has come to discard tradition for tradition's sake, and to see whether there simply isn't a better way.

N73-32887

CRA

CHARLES RIVER ASSOCIATES INCORPORATED

THE SHORT-HAUL AIR TRAVEL MARKET
-- EVALUATION OF NEW FORMS OF SERVICE

Presented by
David A. Coutts
Charles River Associates Incorporated

Introduction

What I want to discuss in this paper are some important but neglected aspects of the demand for air travel and an approach for incorporating them in evaluations of new services. The approach as described here is being used to evaluate the market for STOL aircraft in the 1980's but it could just as well be used to evaluate the market effects of schedule changes, equipment changes, new routes, and so forth, if certain basic data relating these changes to demand are available. A most important change in the market which is likely to take place in the next fifteen years, and which is already underway, is the increasing availability of alternative airports in major cities, and I will show how the effects of this change and its market implications may be evaluated.

A distinctive characteristic of the approach is that it requires no elaborate network simulation model -- the evaluations are made for city-pairs. Obviously an airline must make a final evaluation of any major service change in the context of a network, but it is extremely difficult to parameterize a network model so as to obtain realistic estimates of the demand response to service changes. The more elaborate a model, the more assumptions must be made in constructing it, and the less is the ability to represent the effects of service changes, especially changes not anticipated when the model was formulated. Therefore the fact that the approach is not based on a network model requires no apology. The network implications of the analysis can be considered after the main findings are obtained. It would not be surprising if, in some cases, an incidental conclusion from examining the network implications were that changes in the network are required.

Determinants of Demand

Demand for intercity air travel is likely to depend on characteristics of travelers, their reasons for travel, the origins and destinations of their trips, and the characteristics of air travel and alternative modes of travel. There has not been a detailed survey of the characteristics of intercity travelers and their travel behavior. What data are available give a very incomplete description. They consist only of a continuous 10 percent ticket sample, several airport surveys, and a few passenger surveys in which essential

information was either not obtained or lost in the process of compiling the survey results. None of these attempt to obtain and preserve data on the complete trip made by individual travelers, that is, the door-to-door trip. Thus, to piece together a picture of air travelers and trips required some speculation.

Two obvious characteristics of alternative means of travel are speed and fares. It seems from empirical studies that while these are important, their effect on demand is in their contribution to the total door-to-door times and costs of trips. It has been found, too, that demand is more sensitive to trip time than to cost.

It is possible that demand is more sensitive to some elements of travel time than it is to others. For example, the frequently heard complaint, "I spent more time driving to the airport than on the flight," may reflect a greater demand sensitivity to access time than to line-haul time. It is also possible, indeed likely, that demand is sensitive to other characteristics of air trips such as stops and transfers. While these possibilities exist there has been no systematic investigation to test them and measure the demand responses. We must be satisfied with the assumption that a service which provides shorter door-to-door times than is provided by existing air services would have an advantage, other factors of the service not related to travel time being similar.

Other aspects of service that are likely to be important are frequency of service, safety, and reliability. The effect of frequency has been investigated

as a "schedule delay."¹ If a traveler must depart earlier than he would prefer to, because the next flight would cause him to arrive later than he wishes at his destination, then the time between actual departure time and preferred departure time is the schedule delay. It was found that schedule delay had a definite effect on demand and was treated as part of door-to-door travel time. We have no information on whether or not the sensitivity of demand to schedule delay is the same as sensitivity to total door-to-door travel time. We shall assume it is the same.

The effects on demand of safety and reliability have not been estimated. We shall assume that STOL and CTOL aircraft will be equally safe and reliable.

Congestion is an important characteristic of air travel. It is the cause of delays that contribute to door-to-door travel time (although, as before, the demand sensitivity to delay may not be the same as the sensitivity to total travel time). We must consider delay both in the air system, in ground access, and in terminals.

The short-haul air travel market is primarily a business travel market. A person making a short-haul trip on business will generally wish to depart from home in the evening or in the morning, early enough to spend several hours at his destination, and return home on the same day; or, if his trip is for more than one

¹*Demand for Intercity Passenger Travel in the Washington-Boston Corridor*, Systems Analysis and Research Corporation, Boston.

day he will wish to spend several hours at the destination city on the last day before returning home. In either case he will probably depart from his home rather than from his employment location, and will wish to return in the evening directly to his home rather than to the location of his employment.

Thus, the most convenient airports for originating short-haul trips will be those easily accessible from residences. The most convenient destination airports for business trips will be close to business establishments. The median annual income of air passengers traveling on business is high, \$16,000 to \$18,000. Clearly originating airports should have good access to middle- and upper-income residential areas. While actual destinations may not all be close to the business district of a destination city, many of them are likely to be, and therefore a city center airport could be convenient as a destination airport. On the trip home, a business traveler would probably want to retrace his steps, departing from the city center airport (if such exist) and returning to the suburban airport close to his home where he may have left his car or where his wife can meet him conveniently.

While demand is sensitive to differences in travel cost, not all the cost consists of fares. Easier access might be less costly, as well as less time-consuming and, if so, would be an additional advantage of the service. However, even if total cost increased, either because of increased access cost or higher fares, the combined effect of time and cost could still make a new service attractive to passengers. The implication for

service frequency and other aspects of service are obvious. Passengers may be assumed to weigh together all the characteristics of the door-to-door trip, and not to base travel decisions on a single attribute of the service.

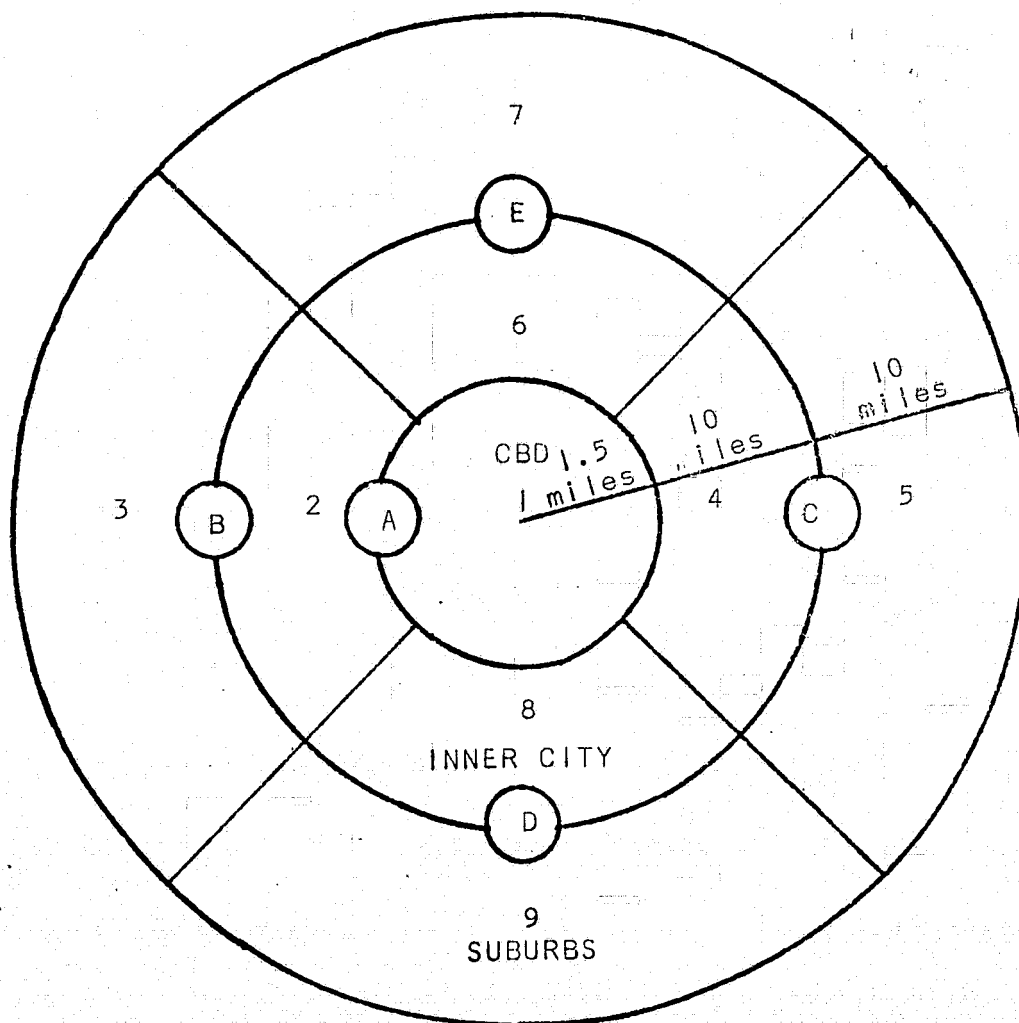
Approach

The approach uses an air route time and fare model, a city model, and a demand model. The air route time and fare model includes simplified flight profile formulas for CTOL and STOL aircraft, but is otherwise quite conventional and need not be described here. The city model will be described in outline and the demand model will be described in more detail.

The City Model

We wish to explore the effect of introducing new services based on airports other than the existing major airports. For this exploration it will be necessary to make assumptions about the locations of airports and the spatial distribution of trip origins and destinations so as to estimate access times and costs for both the new and the existing services. I shall describe the assumptions in terms of a hypothetical, idealized circular city, although an actual city would do just as well. This idealized city consists of a central business district 3 miles in diameter, a ring of inner city zones 10 miles wide, and an outer ring of suburbs, also 10 miles wide (see Figure 1). All except the central zone have been further divided into

Figure 1
THE GENERALIZED CITY

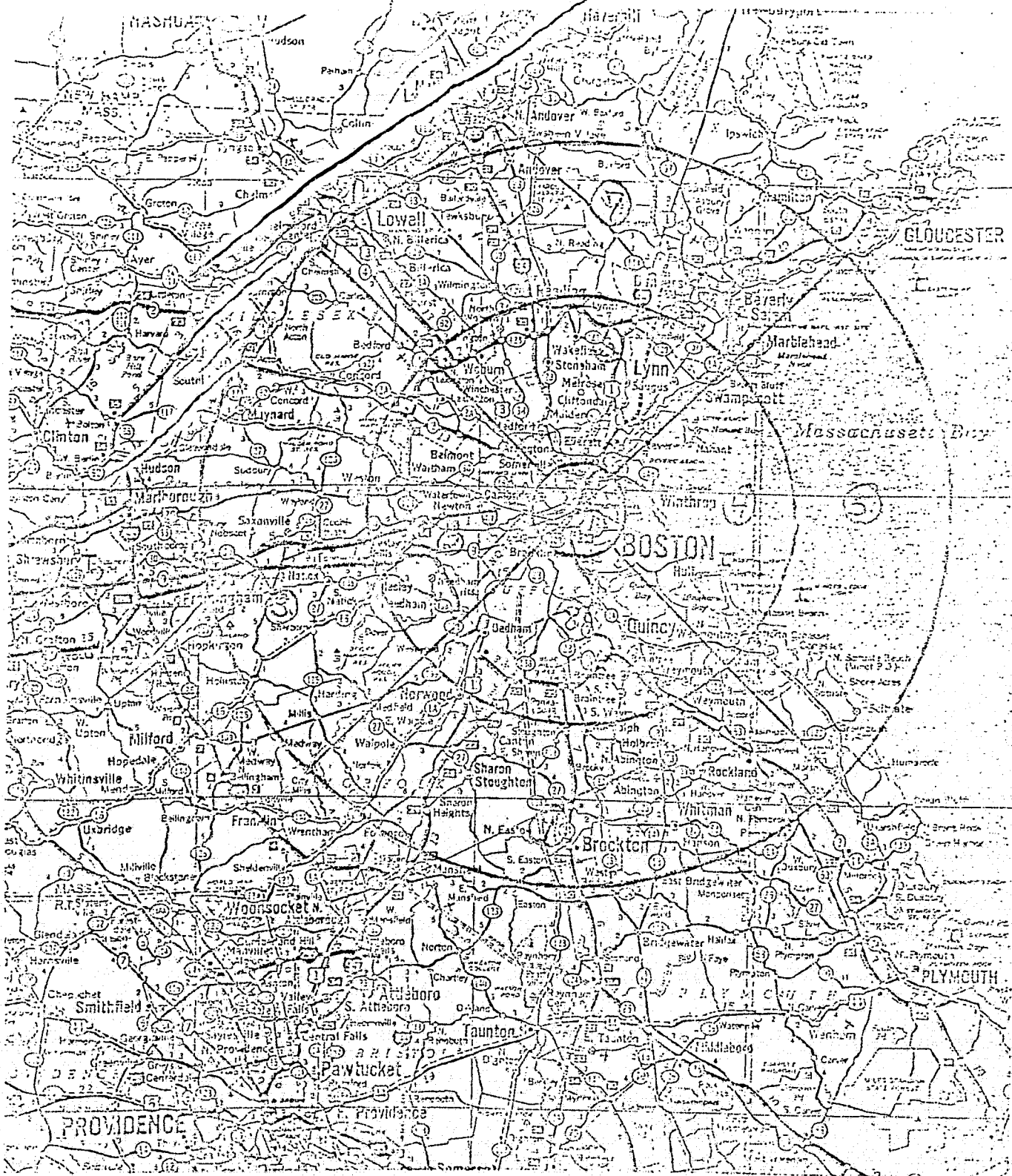


four sectors. Thus, there are nine sectors in the city. Sector-to-sector travel between cities will be a function of the population, income and employment in the zones as well as door-to-door travel time and trip cost.

By locating STOL-ports and conventional airports at various points throughout the hypothetical origin and destination cities a variety of route configurations and new services can be tested ranging from conventional aircraft operating from suburban airports, to STOL aircraft operating from special STOL-ports in a variety of direct and indirect route configurations. The existing large conventional airport has been arbitrarily assumed to be located at point C in Figure 1 while short-haul airports, either CTOL or STOL, may be located at any or all of the other lettered locations -- except A, which is assumed to be suitable for STOL only. It is assumed that STOL aircraft can operate from conventional airports but that conventional aircraft cannot operate from STOL-ports.

Residential and employment density distributions were compared for several medium and large cities and were found to be sufficiently consistent to be used in calculating numbers of households (with incomes above \$10,000) and the numbers of employees in each ring of the hypothetical city. A rough check of the results was made by comparing the city with Boston. Figure 2 shows the hypothetical city superimposed on a map of Boston. Quite a close correspondence was obtained when it was assumed that population and employment are zero in sectors 4 and 5 and that the population and employment of sector 1 is only 75 percent of that calculated

Figure 2
MODEL ADAPTED TO BOSTON AREA



for the hypothetical city. The correspondence might have been further improved by adjusting the radios of sector 1 to represent the actual size of the Boston CBD.

The city model is also used to generate airport access times and costs. Time and cost were calculated for access to each airport from each sector on the basis of a set of assumptions about automobile speeds and costs, and the costs and times of using taxis, airport limousines and rental autos. The traveler's own auto was considered as an alternative only in the origin city and rental auto was considered only in the destination city. Parking costs and waiting times were assumed where appropriate.

The Demand Model

The obvious effect of introducing any of the services we wish to evaluate is that many trips would then be made with shorter access times and lower access costs. Simply adding a new airport has this effect. Of course, other aspects of a new service may be so inferior to the existing service that the access advantage is insufficient to affect demand. This is part of the question to be answered in the study. But in view of the great importance of access which represents about as much time as the flight for many trips, the models were formulated so as to demonstrate access effects clearly. Thus, the demand model is formulated as 81 separate demand functions representing demand for travel from each of the nine sectors of the city of trip origin, to each of the nine sectors of the city of trip destination.

It is useful to consider trips as round trips from the origin. The purpose of a trip and its destination are obviously closely related to the origin, purpose, and destination of the return trip. In the absence of more detailed information on the actual origins and destinations of trips we will assume that they all originate at travelers' residences. We will assume that destinations are distributed according to the distribution of non-farm employment which may be appropriate for business trips but is not necessarily a very good assumption for other trips. Since the direct demand elasticities with respect to time and cost for air travel are indicated to be similar for various trip purposes we shall assume that all are the same as for business trips. Thus, in effect, we are assuming that all short-haul air travel demand is like the demand for business trips. This assumption can be modified, but it is certainly applicable to the large proportion of trips that are business trips, and it is not obvious what better assumption would be representative of other smaller fractions of the market (the various kinds of personal trips).

The demand model we shall use is a constant elasticity model. This choice is taken because it permits elasticities estimated in air travel demand studies to be used directly, because it has behaved satisfactorily in previous demand studies, and because no other type of model has been found to be superior. We do not suppose that another model will not be found to be better when true origin-destination data become available for analysis, but for now the constant elasticity assumption is at least as good as any.

The demand model is:

$$D_{ijr} = K f_{ijr}^{\eta_f} t_{ijr}^{\eta_t} Y_{ir}^{\eta_Y} P_{ir}^{\eta_P} E_{jr}^{\eta_E} \cdot \prod_k [f_{ijk}^{\mu_{fk}} t_{ijk}^{\mu_{tk}}] \quad (1)$$

The variables are as follows:

- D = demand for air trips;
- f = trip cost (door-to-door);
- t = time (door-to-door);
- Y = family income;
- P = population with family income > \$10,000;
- E = non-farm employment; and
- K = a constant.

The subscript i denotes a sector in the origin city, j denotes a sector in the destination city, k denotes a linehaul mode other than air, and r denotes a time period. The index η denotes a direct demand elasticity. The index μ denotes a cross elasticity, that is, the sensitivity of demand for trips by air to cost or time for making the trip by another mode k . The multiplicative operator \prod encompasses all competing linehaul modes.

Let D_{ij0} be the demand for air trips at time zero, where $\gamma = 0$ denotes the time immediately prior to introduction of a new short-haul air service, and let D_{ij1} be the demand a short time after the new service is introduced. We can write the demand function for air trips at time 1 in terms of the demand at time zero:

$$D_{ij1} = D_{ij0} \left(\frac{f_{ij1}}{f_{ij0}} \right)^{\eta_f} \left(\frac{t_{ij1}}{t_{ij0}} \right)^{\eta_t} \left(\frac{Y_{i1}}{Y_{i0}} \right)^{\eta_Y} \left(\frac{P_{i1}}{P_{i0}} \right)^{\eta_P} \left(\frac{E_{i1}}{E_{i0}} \right)^{\eta_E} \\ \times \prod_k \left[\left(\frac{f_{ijk1}}{f_{ijk0}} \right)^{\mu_{fk}} \left(\frac{t_{ijk1}}{t_{ijk0}} \right)^{\mu_{tk}} \right] \quad (2)$$

For some trips the time and cost of travel by air will be changed by introduction of the new service, but family incomes, population and employment will not have changed in the interim. We shall also assume that trip time and cost by alternate modes will not have changed. This probably is true of automobile trips, although a diversion of a large number of automobile trips to air might reduce highway congestion and so reduce trip time and cost by that mode. Diversion of bus and train passengers to air might have the opposite effect -- schedule frequencies for bus and train might be reduced and fares increased -- but the effect on the demand for air travel would be small because there are so few intercity bus and train passengers that a very substantial fraction would have to be diverted for the number of air trips to be much affected.

Thus, the instantaneous effect of introducing the new service is to leave the ratios of income, population, employment and fares and times of competing modes all equal to 1.0. Equation (2) may be conveniently rewritten as

$$D_{ij1} = D_{ij0} \left(\frac{f_{ij1}}{f_{ij0}} \right)^{\eta_f} \left(\frac{t_{ij1}}{t_{ij0}} \right)^{\eta_t} \quad (3)$$

If at some later time 2, income, population and employment will have changed, but fares and travel time will not, the demand will be given by the equation

$$D_{ij2} = D_{ij1} \left(\frac{Y_{i2}}{Y_{i1}} \right)^{\eta_Y} \left(\frac{P_{i2}}{P_{i1}} \right)^{\eta_P} \left(\frac{E_{j2}}{E_{j1}} \right)^{\eta_E} \quad (4)$$

Now consider the total demand for air trips from all origin sectors in one city to all destination sectors in

another. Let D_0 be the total demand before a new air service is introduced and let D_1 be the total demand immediately after. Ignoring competing ground modes,

$$D_0 = \sum_i \sum_j K f_{ij0}^{\eta_f} t_{ij0}^{\eta_t} Y_{i0}^{\eta_Y} P_{i0}^{\eta_P} E_{j0}^{\eta_E} \quad (5)$$

D_0 is a number we can estimate from ticket sample data, but for now assume the value is 100. We can then solve equation (5) for the constant K and calculate each D_{ij0} as a percentage of the total D_0 . If a new service is introduced we can use K to calculate D_{ij1} for each pair of origin and destination sectors using equation (3) and hence calculate D_1 . The resulting D_1 expresses the demand when the new service is introduced as a percentage of the previous demand, D_0 . If D_1 is 140, say, then the effect of introducing the new service is to increase the number of air trips between the two cities by 40 percent.

It is assumed that in choosing which of the alternative routes would be taken for a trip from origin sector i to destination sector j a "value of time" evaluation of the alternatives is made. The combination of air route and access modes is selected which results in the lowest total of actual cost and value of door-to-door time. The resulting cost and actual time of that combination then enter the demand model. The appropriate value of time is usually considered to be a multiple of the traveler's annual income, but the exact multiple is a subject of considerable uncertainty. However, we have found the selection of air routes in the model to be not very sensitive to value of time in

the range \$0.18 to \$0.50 per minute, which corresponds to a range of 1.2 to 3.7 times the median income of air passengers.

Other parameters of the demand model important to this discussion are the elasticities with respect to door-to-door cost and travel time. The following are elasticities estimated in the SARC¹ study.

ELASTICITIES OF DEMAND FOR TRIPS BY AIR

<u>Trip Purpose</u>	<u>Trip Cost</u>	<u>Travel Time</u>
Business	-0.891	-2.103
Personal	-0.914	-2.213

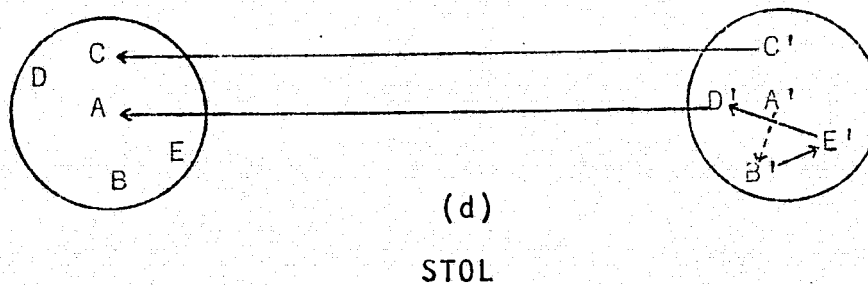
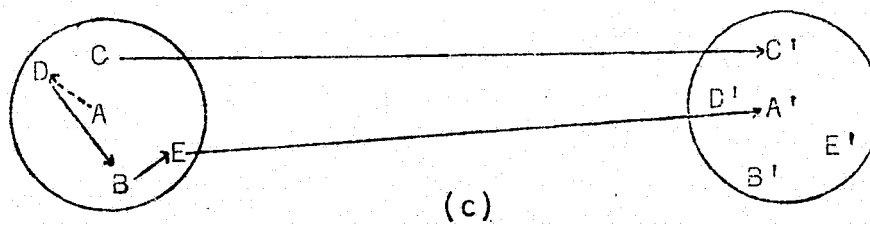
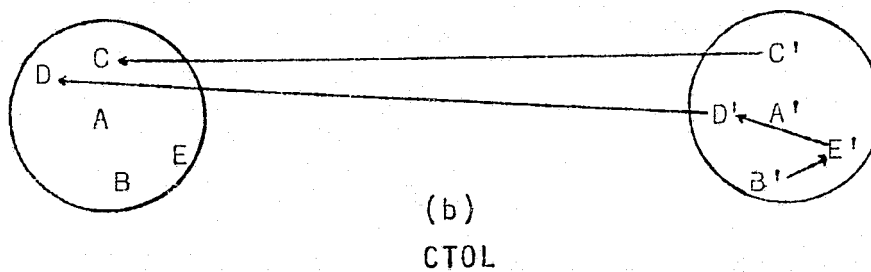
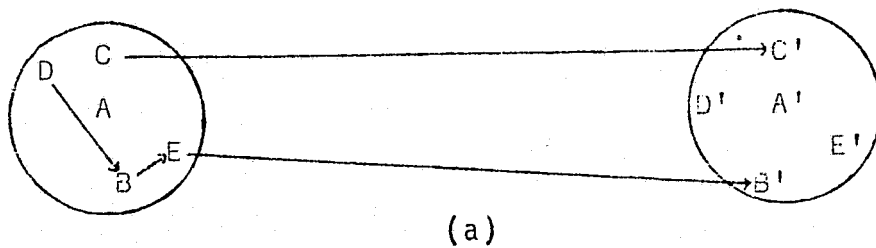
Results

We shall consider several scenarios of future short-haul service, each consisting of a combination of routes and aircraft.

Referring to Figure 3, diagrams (a) and (b) in the upper part of the figure represent a short-haul CTOL service; the diagrams in the lower part, (c) and (d), represent a short-haul STOL service; and in both cases the new short-haul service is competing with the conventional major airport service. The STOL service collects passengers from suburban airports in each city and carries them to the central STOL-port of their destination city. We have assumed that on the return trip passengers would find the aircraft had reversed direction on the route so that service would be from A in their destination city to the suburbs in their city of residence.

¹Systems Analysis and Research Corporation, *op. cit.*, p. 5-47.

Figure 3
SCENARIO I -- CTOL AND STOL



The demand analysis of Scenario I is summarized in Table 1. The data in the table are for the assumption of an intercity distance of 185 miles. Case 1 is the conventional major airport service whose level of demand (in trips) is assigned the index value 100.

The results indicate that with the FH-227, a 40-passenger jet-STOL having a speed of 400 miles per hour (STOL-40) and the DHC-7 operating on Scenario I, total demand would increase between 9 and 12 percent, and 10 to 27 percent of the trips presently carried by the conventional service would be diverted to the new service. The DC-9 in Scenario I would divert 58 percent and result in an increase in the total demand of 29 percent. A 120-passenger STOL with a speed of 500 miles per hour (STOL-120) would divert 53 percent and increase total demand by 44 percent.

In all the cases shown in Table 1 the proportion of short-haul trips originating at airport D is very small, suggesting that better results might be obtained if the cost of serving airport D were not included in the fare. Scenario II is like Scenario I except that the short-haul route originates at B instead of D. Table 2 compares the two scenarios for two cities 185 miles apart. The fares are considerably less for Scenario II and as a consequence more trips are demanded. Scenario II is clearly the superior. Another observation can be made from the table -- the faster aircraft, the DC-9 and the STOL-120, are superior to the others in both scenarios. It might have been expected that STOL characteristics of the STOL-40 and the DHC-7 might compensate for low speed in flights as short as 185

Table 1
SECENARIO I -- DEMAND
(Intercity Distance 185 Miles)

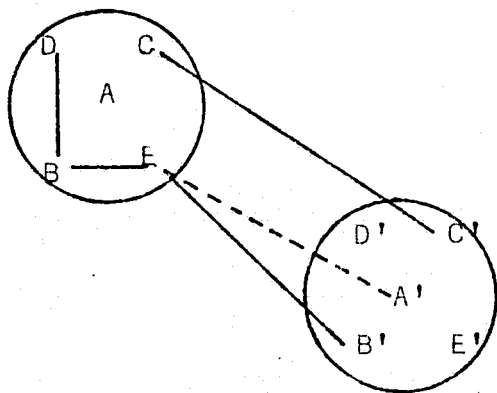
Case	Aircraft	Fare ¹	Airports		Block Time (Minutes)	Demand Index
			Origin	Desti- nation		
1	C.S. ²	\$22.00	C	C'	55	100
2	C.S.	22.00	C	C'	55	42
			D	B'	75	4
	DC-9	28.80	B	B'	58	23
			E	B'	37	60
						<u>129</u>
3	C.S.	22.00	C	C'	55	75
			D	B'	99	1
	FH-227	30.42	B	B'	79	7
			E	B'	59	27
						<u>110</u>
4	C.S.	22.00	C	C'	55	47
			D	A'	68	4
	STOL-120 ³	34.82	B	A'	51	28
			E	A'	35	65
						<u>144</u>
5	C.S.	22.00	C	C'	55	90
			D	A'	62	0
	STOL-40 ³	50.83	B	A'	48	4
			E	A'	34	15
						<u>109</u>
6	C.S.	22.00	C	C'	55	73
			D	A'	89	1
	DHC-7	38.23	B	A'	73	12
			E	A'	56	26
						<u>112</u>

¹All passengers on the short-haul service pay the same fare. Fare includes 8 percent U.S. tax.

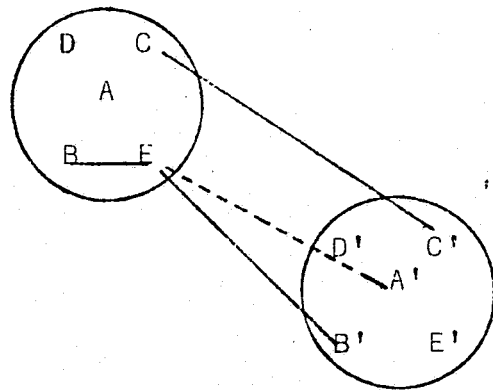
²C.S. denotes existing "conventional" service connecting major airports.

³Jet-STOL fares in this table are calculated on the manufacturing cost only, without allowance for R and D costs.

Table 2
COMPARISON OF SCENARIOS I AND II
(Intercity Distance 185 Miles)



Scenario I



Scenario II

Case	Aircraft	Scenario I		Scenario II	
		Fare	Demand Index	Fare	Demand Index
1	DC-9	\$28.80	129	\$24.75	137
2	FH-227	30.24	110	27.05	112
3	STOL-120 ¹	34.82	144	31.69	153
4	STOL-40 ¹	50.83	109	44.43	122
5	DHC-7 ¹	38.23	112	34.55	117

¹STOL aircraft operate into STOL-port A'. CTOLs operate into airport B'.

miles, but this does not seem to be the case. The FH-227 has neither speed nor STOL characteristics, and that it can offer a relatively low fare is apparently not sufficient to compensate for the disadvantages. The STOL-120 has both considerable speed and STOL characteristics.

At an intercity distance of 500 miles the advantage of speed becomes more pronounced, but the STOL characteristics of the STOL-120 are still more than sufficient to compensate for its cruise speed disadvantage in relation to the DC-9. Table 3 compares Scenarios I and II for this intercity distance. Only the DC-9 and the STOL-120 are able to compete at all effectively with the conventional service, but both do so with comparable success. On a performance basis the STOL-120 appears to have the advantage, but the DC-9 is able to offer service at considerably lower fares.

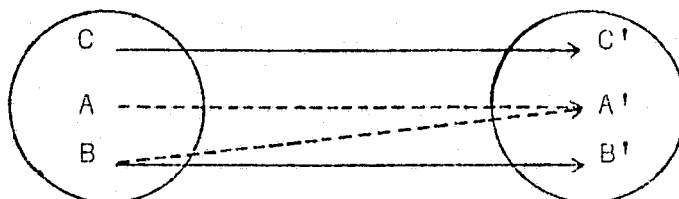
All the above results were obtained assuming that the STOL-40 and STOL-120 would be priced on the basis of manufacturing cost. If we consider that the cost of research and development might amount to \$2 million or more per aircraft, then if this cost were to be passed on to the passengers the fares would have to be higher. Since the STOL-40 is apparently unsuccessful even when priced on the basis of manufacturing cost alone, we will not consider it further. We will also ignore the FH-227 and the DHC-7 in the subsequent scenarios.

Scenario III (Table 4) consists of three cases in which a nonstop short-haul service competes with conventional service. The intercity distance is 185 miles. In Case 1 a DC-9 operates between suburban airports B

Table 3
COMPARISON OF SCENARIOS I AND II
(Intercity Distance 500 Miles)

<u>Case</u>	<u>Aircraft</u>	Scenario I		Scenario II	
		<u>Fare</u>	<u>Demand Index</u>	<u>Fare</u>	<u>Demand Index</u>
1	DC-9	\$37.91	128	\$36.00	131
2	FH-227	48.03	100.1	45.95	100.3
3	STOL-120	47.12	126	44.00	134
4	STOL-40	-	100.0	69.96	101
5	DHC-7	-	100.0	-	100.0

Table 4
SCENARIO III
(Intercity Distance 185 Miles)



Case	Aircraft	Airports		Fare	Demand
		Origin	Destination		
1	C.S.	C	C'	\$22.00	23
	DC-9	B	B'	20.87	121
	TOTAL				144
2	C.S.	C	C'	22.00	23
	STOL-120	B	A'	24.22	151
	TOTAL				174
3	C.S.	C	C	22.00	12
	STOL-120	A	A'	24.85	176
	TOTAL				188
2A ¹	C.S.	C	C'	22.00	25
	STOL-120	B	A'	28.19	133
	TOTAL				158
3A ¹	C.S.	C	C'	22.00	12
	STOL-120	A	A'	28.82	158
	TOTAL				170

¹Cases 2A and 3A are like Cases 2 and 3, respectively, except that the fares in 2A and 3A are sufficient to recover \$2 million for R and D costs in the price of each STOL-120.

and B'. The DC-9 service has a lower fare than the conventional service and is not delayed by the congestion at major airports. It is able to divert 77 percent of the conventional service's demand and to induce an increase of 44 percent in total demand.

Case 2 is a STOL-120 operating from airport B to STOL-port A' and from B' to A. (The hops from A' to B' and from A to B are assumed to attract no passengers.) Case 3 is a STOL-120 service between STOL-ports A and A'. Both of these cases show much greater demand than the corresponding Case 3 of Table 2.

All these cases show that direct flights attract more trips than flights which stop *en route*. It should be noted that this result is due to the lower fares of nonstop service. In all the scenarios a direct flight is available and, indeed, the calculations show that the airport at which direct service is provided always originates the most trips. The progression through Scenarios I, II, and III is one of decreasing service and decreasing fares, except for Case 3 of Scenario III, the service between Airports A and A' which has no counterpart in the previous scenarios. The significance of Case 3 is that, for our assumed distribution of trip origins and destinations, service between central airports seems to be preferred to service between suburban airports or between suburban and central airports, even though the fare is higher.

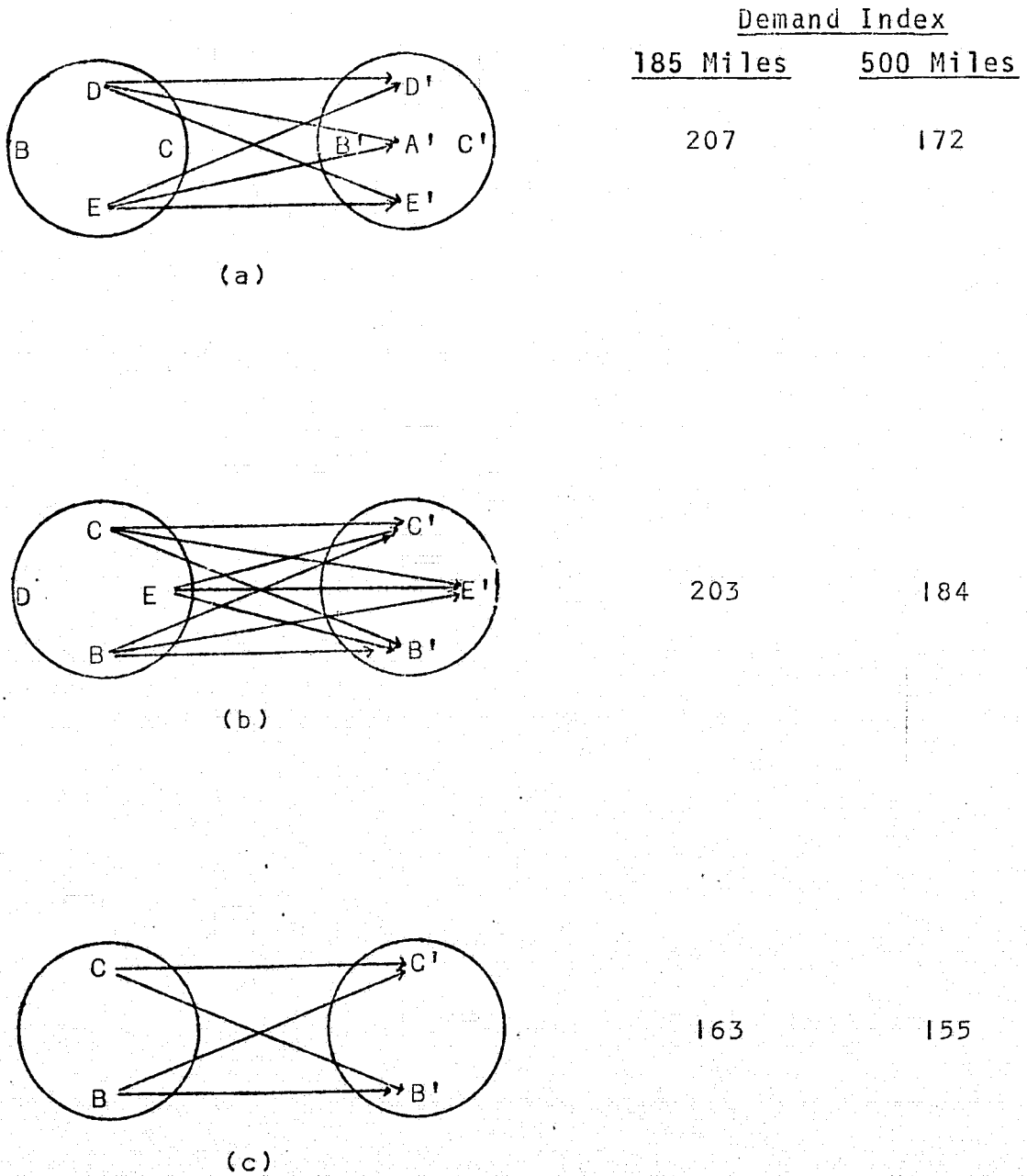
Cases 2A and 3A in Table 4 differ from Cases 2 and 3 in that the fares are set high enough so as to recover \$2 million of R and D costs on each STOL-120. Even with this higher charge the demand for STOL-120 trips is

Table 5
SCENARIO III
(Intercity Distance 500 Miles)

<u>Case</u>	<u>Aircraft</u>	<u>Airports</u>		<u>Fare</u>	<u>Demand</u>
		<u>Origin</u>	<u>Destination</u>		
1	C.S.	C	C'	\$43.00	12
	DC-9	B	B'	30.53	<u>127</u> 139
2	C.S.	C	C'	43.00	12
	STOL-120	B	A'	37.59	<u>132</u> 144
3	C.S.	C	C	43.00	9
	STOL-120	A	A'	38.22	<u>143</u> 152
2A ¹	C.S.	C	C'	43.00	31
	STOL-120	B	A'	44.60	<u>98</u> 129
3A ¹	C.S.	C	C'	43.00	25
	STOL-120	A	A'	45.20	<u>110</u> 135

¹Cases 2A and 3A are like Cases 2 and 3, respectively, except that the fares in 2A and 3A are increased to recover \$2 million for R and D costs included in the price of each STOL-120.

Figure 3
MISCELLANEOUS SCENARIOS



greater than for DC-9 trips -- or rather, the combination of STOL-120 and the centrally located STOL-ports has an advantage over the DC-9 which is restricted to suburban airports.

Where the intercity distance is 500 miles the DC-9 has the advantage over the STOL-120. Table 5 summarizes the analysis of Scenario III for this distance and shows that if R and D costs of STOL are ignored the STOL-120 has a slight advantage operating between a suburban airport and a central STOL-port, and a distinct advantage operating between two central STOL-ports. However, if STOL fares are increased to reflect \$2 million R and D cost per aircraft the demand for suburb-to-suburb service by DC-9 is slight greater than for STOL service between central airports.

Several other scenarios have been considered. Some appear capable of inducing an increase of more than 100 percent in the demand for trips. Three of them are diagrammed and their demand indexes noted in Figure 3. Diagram (a) shows two cities connected by six routes, four of them operated by DC-9s and two by STOL-120s. The conventional service is assumed to be discontinued. In the 185 mile case the two STOL-120 routes have a combined demand index of 127 and the four DC-9 routes a combined index of 80.

Diagram (b) shows a similar demand response to the introduction of 8 new DC-9 routes. The model output for this scenario shows that routes originating or terminating at a major airport (C or C') have the lowest demand indexes (since they are assumed to be affected

by congestion delays and higher landing fees). If airports D and D' were used instead of C and C' the index for this scenario would be higher.

Diagram (c) is the conventional major airport service (C - C') supplemented by three DC-9 suburban airport routes. Again, the results are lower than they would be if the major airport service were replaced by another suburban service. Even so, this CTOL scenario has a demand index comparable to the STOL-120 scenario 3A (Table 4).

Conclusion

I have tried to be brief and in so doing have passed over such questions as the cost and performance of jet-STOL aircraft and several other matters I would like to have discussed. The study on which this paper is based considered airport noise and congestion which are obviously important but which have not been discussed here. For example, it might have been mentioned earlier that the apparent disadvantage of conventional major airport service in competition with new service derives mainly from assumed congestion delays. In calculations that are not included here congestion delays are also assumed in the new services and diversion of traffic from the major airports is assumed to reduce congestion delays in conventional services. Let me point out that it is important to consider congestion delays. Delays on some routes are so common that a substantial allowance is made in the schedules. And

with regard to STOL I would like to suggest that a Manhattan STOL-port would very likely become the most congested airport in the world.

It has not been my intention to make strong claims for the models described here. They are convenient and plausible, but better models could certainly be proposed. What I do want to stress is the power of the approach. It has seemed to me that airlines tend to compete in advertising and "cosmetic" features of service rather than in more fundamental aspects, and that instead of looking for new ways to stimulate air travel they concentrate on obtaining their share of the existing market. This they do even to the extent of having the same departure times as their competitors on some flights serving the same route. The demand sensitivity to schedule delay indicates that more trips would be made if the departure times were different. Furthermore, scheduling several departures for the same time is a cause of congestion delays which have a negative effect on demand. My guess is that the approach described here -- the use of relatively simple, but general models -- can be applied to analyzing important questions and will give more useful results than an elaborate simulation model taking twice as long to develop and costing four times as much.

N73-32894

GEORGE EADS - Thursday, 13 July

THIRD LEVEL AIR CARRIER SERVICE

Two weeks ago I became an Associate Professor of Economics at George Washington University and so I can't claim to speak for the Justice Department any more. However some of the comments I will make on Monte Lazerus' presentation reflect work that was done while I was at the Justice Department. Another thing I should tell you is that about two years before I went to the Justice Department, I began a study of the Federal program of subsidizing the local service airlines. The study was essentially finished before I went to Justice and is being published by the Brookings Institution. This study was done completely independently of the Bureau of Operating Rights study that Monte has just talked about. Amazingly enough both BOR and I identified the same problems with the current local series subsidy program. We arrived at the same set of policy options facing the government, and we reached the same general conclusions as to which cities should be served and what it should cost to serve them. It is the first case that I know of private study and a government study undertaken completely independently coming to such parallel conclusions. In fact I was a bit shocked when I heard that BOR was going to beat my publication date.

I think that the most logical follow-on to Monte Lazarus' talk might be to comment on the CAB draft bill, S3460. In general OMB, Justice and DOT appear to support the bill strongly. They all thought

it very innovative. I was particularly happy to see the limitation of \$2 million a year on the proposed program because if you look back at the original local service experiment one of the real problems was it started out as a limited experiment and quickly got completely out of hand. The \$2 million a year limitation is essential I believe. However, I am afraid that it may be raised as certain Senators see they can use this bill as a vehicle to expand local air service. I view the bill (and I think the CAB does also) in large measure as a way of providing existing or somewhat better quality of air service to cities now being served at substantially lower costs.

We talked about the Allegheny commuter experiment quite a bit this morning. Let me try to contrast the Allegheny experiment with some of the attempts at route replacement that have been attempted in North Dakota. In the Allegheny system you are dealing with a densely populated area here in the East. In most cases you have good forms of alternative transportation. The local service carriers are in points in this region primarily for historical reasons, not because air transportation of the sort they provide has ever been a major advantage to the public. You find that when you replace a one or two flight per day, inconveniently timed pattern with a multiple flight per day pattern you generate a good deal of additional traffic, winning it away from the roads and, in some cases, the railroads. You can make this into a profitable situation for a low-cost air taxi operator. Therefore you can find independent contractors who are willing to enter

into an Allegheny type commuter operation and Allegheny can conduct it at virtually no cost. The example I am most familiar with is the service from Trenton down to Washington via Philadelphia. Allegheny was operating in this market providing two flights per day at very inconvenient times. By 1969 they were down to somewhat below 6000 originating passengers per year even though Trenton has a population of over 100,000. There is a lot traffic between Trenton and Washington but Trenton is also on the main line of the Penn Central Railroad and is one of the few places that really has good rail service. Furthermore you have interstate highways all over the place.

Ransome Airways began operations between Trenton, North Philadelphia, Philadelphia, and Washington not long after the CAB liberalized its air taxi regulations in the mid-1960's to allow these carriers to compete with certificated carriers. After a brief period of growth mania of the sort that recently led to Executive Airlines' downfall, Ransome decided to concentrate on serving these four cities, the ones it knew best. When I started teaching at Princeton in the fall of 1970 it already had worked out a deal with Allegheny to handle its reservations and its ticketing at Trenton, though it was not then an official Allegheny commuter. Allegheny began to cut back even more service until it was offering the minimum possible schedules at the worst possible times -- flights were timed for the convenience of the carrier rather than for the convenience of the passengers. Finally, Ransome and Allegheny negotiated an official Allegheny commuter contract.

Ransome has been quite successful. In fact, it recently sold some of its 15 passenger Volpor Turboliners (Buck 18 conversions) and acquired some of Allegheny's mothballed Nord 262's.

In this case providing frequent air service timed to suit the needs of the local community has has a major stimulative effect on traffic, and this has permitted turning an unprofitable operation into a profitable one. An essential factor has been the use of smaller aircraft and the cutting out of all frills in the service.

In the region in which Frontier Airlines tried its air taxi replacement (I am referring specifically to the North Dakota experiment with Apache), additional frequencies would stimulate little additional traffic. These are small communities and will never generate much traffic. The use of air taxi-type aircraft only serves to lower cost -- and subsidy requirements.

The contrast between these two cases also reveals why the Allegheny commuter replacements generally got community support while the Frontier replacement was fought. In the former case, flight frequency increases as the timing of flights improves. The community will put up with smaller aircraft in exchange for this. In the Frontier case, you traded low frequency Convair 580 service for low frequency air taxi service. There is little wonder the communities howled. People being heavily subsidized will always prefer a better service to a poorer service. The people in North Dakota would like jets -- provided they didn't have to pay for them.

In the east where good transportation alternative generally exist,

short-haul, low-density air service can (and should) be provided without a subsidy. Where it cannot pay its own way, there is no case for subsidizing it. But in some areas of the far west, and especially in Alaska, a strong economic case can be made for government support for some level of air service. It is just a question of how much service you want to subsidize.

Question: "What is your objective to the Congress' motive to try to bring the air transportation where it is not today? You said you were afraid that they would use it to expand..."

A: Look at where air transportation is today. It is pretty much every place that can use it and probably beyond that point. However, the decision to subsidize is pretty much a political decision and if Congress feels that 500 additional cities "need" air service, and I will put the word "need" in quotes, then Congress can do that. Just appropriate the necessary money. Back in 1944 when the Board was talking about setting up the local service carriers, one proposal was to provide scheduled air service to every community in this country with over 5000 population. I don't care where you draw this line -- Congress can appropriate as much money as it wants -- but the key point is wherever you draw the line, the cheapest way to provide service is by use of a bid system of the sort that the CAB is proposing. Congress apparently does not like the use of small planes. I have talked to some of the people on the Senate Aviation Subcommittee and that is one of their big sticking points. O.K., if you don't want the small planes, if you

don't want a Twin Otter, move the minimum aircraft size limit in the bill all the way up to a DC-9. I don't believe that's right but if that's the way Congress want it, let them do it that way. But still use a bid system. Again, a bid system is the system that provides the maximum incentive to efficient operation.

Senator Cotton, for example, believes there should be, there "ought" to be, air service into Waterville Valley. And he says that Waterville Valley is an isolated place even though it is only 2½ hours from Boston over excellent roads. Unless you put in a minimum of 5 flights a day almost everyone is going to drive up except those people who happen to arrive at Logan Airport just the time the plane is leaving. Furthermore the traffic peak here, and that's during the winter, could probably support its own service without subsidy. But Senator Cotton says that Waterville Valley "ought" to have air service, and Senator Cotton is on the committee that votes the subsidy. So I would predict that one of the areas the CAB is going to have to "experiment" with will be New England, though I hope not. (From the floor: There is a reason why -- VOLPE(?) -- specific to the New England case). This is the way the subsidy gets votes and, in fact, as Monte pointed out, if you read the history of the debates on the subject -- Congress never says "let's cut it," they say "why aren't you asking for more?" Because subsidy is a very small item in the Federal budget. The fact that the subsidy is running to \$40 a passenger or more at some of these points doesn't seem to bother Congress.

So to get back to your question, the answer is Congress who votes the subsidy decides what type of air service the country ought to have. (From the floor: No that wasn't my question. My question was as an economist don't you find it appalling to move air service in where it doesn't make sense economically?)

A: I look where air service is and I look at the cities where they are talking about putting it in and I can't see the benefits. But if the local community wants to subsidize it, fine. That's a thing which I think we should push more on. If a regional area or a local area wants to have air service they should be allowed to subsidize it. But from the viewpoint of the nation as a whole I can't see the benefit.

(From floor: Is there a community in the states now that is contracting for this type of service?)

A: I had a phone call from the Southeast Regional Council and apparently they have been putting some funds into a commuter carrier somewhere in Georgia. (Discussion) If you go back to 1944 when local service carriers were first established (again I have this tabulated in the book) and you see the cities that had air service and the cities that didn't have air service, you see that even then we had a pretty good system of air service. And then we added the locals on top of that and then we expanded the locals during the '40's and the 50's and finally we have had a huge expansion of the highway system. Add to this the fact that if you operate at any decent frequency of air service at all you are going to generate a large number of seats, even if you use smaller aircraft, and you quickly conclude that

expanding air service to more cities just doesn't make much economic sense. But if Congress wants to do it there is no way to stop them. We can show them the cheapest way of doing it and that's really it.

(From floor: That's really the most important objective -- the cheapest?)

A: Well if you have two alternatives -- A and B -- and they will give you the identical service, and if A costs half of what B does, then I think Congress would want A. They can get any level of service they want with a bid system. They can specify 50 flights a day and they can specify that they be flown with 747's. Still, the cheapest way is the bid system.

(From floor: Aren't you in fact saying that transportation should always follow instead of being the leader?)

A: No, I am saying that the way air transportation has been used in this country, it has not made much difference in the rate of regional development (except, perhaps in Alaska), and I don't believe a significant expansion of the program would improve the record any.

(From the floor: But that doesn't necessarily make it right. The highway program has just changed. They got a \$100 M program appropriation out of Congress and they are accelerating highway development for the express purpose of developing economic areas that are rural in Vermont. Now there is a change in the use of transportation -- rather than putting a road in there for people to move someplace -- if that's possible.)

A: Let's put it this way. We have had a system of air transportation and we have put out approximately a billion dollars in subsidy over the last 25 years for the purpose of encouraging rural development. We've had a pretty good level of air service in a lot of these communities until the last couple of years. And it hasn't worked. The population has still continued to shift. Now if you believe that West Podunk, N.D. would grow into a great metropolis if it has air service you could put it there. Economics will not support you on that.

(From floor: You are saying that air service alone won't do it -- it needs tax incentives from the state, etc.)

A: If you give people enough money you can establish a city in the midst of the Sahara Desert. It's questionable whether that is economically viable, but you can do it.

Why don't we move on to some specific objections to the formulation of the current bill? (S3410) As I say, I generally support the bill but I do not support, and I don't think the Department of Justice will support, the provision of the bill allowing the CAB to specify the limitation on minimum aircraft capacity. If it is felt that for safety reasons a twin-engine aircraft with two pilots is needed, then put that in the bill. But if the twin-engine aircraft with two pilots has only two seats for the passengers, then I think that you achieve your safety objectives and still allow your operator this flexibility. In certain of these regions, a four-seater plane with two pilots shuttling constantly between two airports might well be the best way

of providing service. If the operator believes that it is the cheapest way of providing safe, efficient air service, I think he should have that option. I don't think that will be the way that will work out in many markets but I hate to limit the freedom of the operator by requiring the use of fifteen passenger planes because what you are doing there is increasing the cost to the government with virtually no increase, if any, in safety. Hopefully the maximum rate provision will be ineffective. The rate that's set will be such that the carriers operating smaller aircraft will not hit the ceiling. But suppose that the operator figures out that the profit maximizing fare in a market is \$18 and through some formula you have told him he can only charge \$16. All you are really doing is saying that it is in the national interest to pay every passenger who flies that route an additional \$2. And again I find that to be somewhat objectionable as an economist but I can see the political reasons why these things are necessary in the bill.

Additionally, I object strongly on page 6, section 7B, to the exception of section 401, subsection k from the CAB ability to exempt section 401 k of the Civil Aeronautics Act writes into the Civil Aeronautics Act what was called Decision 83 which set up the current pay system for airline pilots. And the denial of the exception to exempt this section essentially writes an ALPA pay scale into this bill. If contract operators find it necessary to unionize and to pay ALPA wages I have no objection. But I don't think they should be forced to pay ALPA wages, although I do recognize again that this provision was

put in for political reasons and I do not want to take any chance of sinking the Bill just over this objection. I think it should be recognized, though, that the effect is going to be a substantial increase in cost and it is going to also pave the way for unionization of the air taxis.

(From floor: It seems to me that the bill is asking bidders to make some pretty in-depth economic analysis and very probably you are going to get some bids in with less analysis than was necessary.)

A: Well that is the purpose of the bonding system -- to assure that bidders are able to perform as required by the contract -- though it does raise the cost of entry. However we are taking some risk here. One reason that this bill proposes a limited experiment is to learn if these operators can make the calculations required. We are not going, and I would not want to go, completely over to this system without such a trial although in my experience in talking with some of these people I find that they are quite sophisticated businessmen. They know how much it costs to run their operation and they know roughly how many people are going to fly. They may not have computers and may not know about advanced technology, but they know how their operation runs. I am more optimistic than you may be on this point,

(From the floor:

A: I do not think we will lack for bidders and I think a lot of the bidders will present some very good bids. Some of the people I have talked to are fairly sophisticated.

(Discussion)

My understanding that the rate limit is probably going to be at what the local service air carrier is charging now on a given route which probably puts the limit at a point beyond what the air taxi is going to charge anyway. I think the limit will be, in effect, a moot point that is put in to maintain some semblance of regulatory control. I am referring to the maximum rate -- clearly they should not put a floor under rates.

I would like to talk briefly now about the presentation Bill Swan made this morning and, in particular, follow up on his division of air taxi operators into three classes -- professional commuter carriers, growth oriented airlines who consider the Part 298 exemption as a step toward becoming a certificated carrier, and "mom and pop" air taxi operators. I think this classification is very instructive as an aid to understanding the different viewpoints concerning some of the proposals to change air taxi safety and economic regulation.

I want to concentrate on the first group -- the professional commuter carriers -- since they are the ones who are carrying the bulk of the traffic. As Bill said, 80 to 90 percent.

Earlier a question was raised concerning profitability. I have here a survey recently made by the Commuter Air Carrier Conference covering 44 of its members--most of which I presume are members of the first class of carrier. In 1971 about half of these people reported that they were making money. Now it's not to their advantage to report

that they're making money -- a lot of these are subsidiaries of other corporations and there are lots of tax considerations here. Furthermore the last thing you want to do if you're in a situation with no route protection is tell how much money you're making. It is interesting that if half these carriers did make money, they did considerably better than the trunk lines did in 1971. I don't know how that's going to go in the future, however.

I found Bill's second class of air taxis, "growth oriented companies," to be a good characterization of the local service carriers. These carriers never were and never will be commuter specialists -- companies such as the first group only using larger aircraft. They have always been seeking to become track-type operators. Their neglect of smaller communities is not a new thing -- it has occurred since the first.

What explains this? In large degree, it can be traced to the type of route system and operating restrictions originally established for them by the CAB. Most routes originally were laid out between two hubs that already possessed air service. A number of intermediate points were added and the local service carriers were set up to serve these points. Obviously the Board could not give the new carriers freedom to operate as they chose because they would have concentrated on providing service between the hubs -- that was where most of the traffic was and still is. So the Board required that all flights start and end at designated terminal points and stop at every point in between. That didn't last very long for it soon became obvious

that the locals were flying practically empty over many of their route segments. Therefore the Board began to relax the restrictions it had imposed and it did so in a way that encouraged the local carriers to concentrate their attention on winning traffic away from the trunks rather than developing into short-haul specialists such as Bill's group 1 carries. My data show that even as early as 1952, less than half of all local service passengers connected with another air carrier on part of their journey, whereas, as Bill reported, about 80 percent of commuter carrier traffic is connecting traffic.

So I believe that the reason that most of the local carriers are interested in maintaining the weight limit exemption is that they don't want the current group of air taxis to emulate their example. My view of the weight limit exemption is that it is desirable to move up the limit. I would like the air taxis to have the option of using larger aircraft. And it might be nice for them to be able to carry greater fuel reserves. I see no problem in allowing them to carry stewardesses, to put in washrooms, galleys, or anything else they want. The only time I would worry about raising the exemption would be if there were some form of route protection. If there were, I would be very worried about this increase in the weight limit because what you would have happening is what happened with the local carriers -- namely, moving into uneconomic aircraft and being protected from the consequences. As long as the air taxi operators are not protected from the consequences of bad management decisions, I am willing to give

them as much freedom as they want, recognizing that the 30 passenger, 7500-lb. limit is still designed to protect the local carriers.

(You cannot read the examiner's ruling without seeing that all the way through it.) The local carriers won't use this size of aircraft any more so we can go up to 30 seats without hurting them much. And the way things are going I would predict in a very few years they may be able to take it up to 50 or 60 seats. I don't mind raising the ceiling but I would predict that most of the commuter carriers would still find it most economical to use the aircraft with roughly 20 seats.

One thing an increase in the ceiling does do is raise the potential range of operations within which carriers not subject to economic regulation can operate. With a 12,500 lb. limit, you have an effective flight radius of about 200 miles that you can fly with a passenger load of 15 or 20 and keep within that weight limit. Raising the limit as proposed moves that radius out further.

So I see no problem in that. But I see where the local carriers would consider it to be a potential problem because it moves these carriers more into competition with them. I would see where the ALPA would like it because the ALPA does not like the fact that many air taxis use nonunion pilots. And raising the limit is a subtle form of de-regulation. If you gradually lift this limit up to infinity you would be de-regulating the airlines. Again I am not against that at all.

(Have you considered eliminating the weight and size limit and basing it on the route length, say 100 miles, to give free reign on what type of airline could fly 100 miles?)

A: With the limit of under 100 miles you are going to get the air taxis, back to the very small airplane, because if you are going to by air travel within 100 miles you must offer very high frequency. And if you offer very high frequency you either generate lots of seats which requires a very high density market, or you have to use smaller aircraft.

(Some of the third level carriers say they need a bigger airplane even than the 30 passenger limit. They could use a 40-50 passenger airplane during peak hours.)

A: I don't find any problem with that as long as there is no route protection. If you say a commuter carrier could use a 747 that's fine with me and they may be right. But I don't want to have a grant of monopoly which is what route certificate is, and then allow them to use the 747. A certificate provides an implicit commitment to maintain the carrier in operation. Once the carrier gets a certificate the government is very reluctant to let it go broke.

(I don't know that 100 miles is the right breakoff point; I am just curious whether you have considered the route length, rather?)

A: Any constraint you put on an operator has certain advantages and disadvantages. I don't see what particular advantages the 100 mile thing has except for maybe the carrier you mention (Houston Metro(?)) and I'm not really sure they need more than a 30 passenger aircraft.

I don't know their operation that well.

(The possible advantage would be that the regional carriers and the trunks don't want to operate in that area?)

A: But if you set the limit up to 200 miles, you can get some pretty good routes -- NY/Wash. -- some of the California routes.

(The only thing you are really protecting is the local service carriers.)

A: I am not interested in protecting the local service carriers at all. But I would prefer to have the weight limit raised the way is being done and provide the local carriers with some degree of protection this way than to "protect" them the way they want to be protected. They want to be able to veto any competitive service established within fifty miles of a point they (or any other established carrier) serve. That is their concept of "route protection."

(Aren't all these discussions concerned with aspects of the bill that would provide route protection?)

A: The bill (S3460), the subsidy experiment proposal, is not aimed specifically at providing route protection for anyone. It is aimed at providing equal or better service to smaller communities at lower cost to the government. The weight limit hearing now before the CAB is a separate thing entirely. It is aimed at changing the restrictions to allow air taxis to operate larger aircraft. Right now they can't operate any aircraft over 12,500 lbs. maximum gross takeoff weight without a special exemption.

(But the weight limit restriction is there to protect the local carriers.)

A: I know, but it is not the same as route protection. Route protection includes the grant of a monopoly franchise which neither S3460 nor the weight limit increase does, though the latter is aimed at retaining some protection for the local service carriers.

As I just said, what the local service carriers view as route protection would exist if the existing carrier had the right to say that a new entrant could not begin service on any route where there is already a carrier operating (including a commuter carrier, a local service carrier, or a trunk line) unless the existing carrier approves. And not only this, but they are asking for the existing carriers to have a veto power over the establishment of any new service 50 miles in any direction. This is like the current restriction on baseball franchises. If Washington can attract a new baseball club it could not move that club into Washington unless the owner of the Baltimore Orioles allowed them to move in. The reason is to protect the monopoly rights of the Baltimore Orioles.

(This suggestion about limitation based upon distance has one advantage from your point of view of supporting the hub and spoke approach which you happen to favor.)

A: I don't happen to favor it. I don't favor any particular system of routes. Some people have said in fact that the reason we have a good air system in this country is that we don't have hub and spoke. I don't know but I think it is rather interesting to see the differences

in the route structure that has developed under a regulated and an unregulated system, and for some reason the fact that a basic hub and spoke has developed under an unregulated system suggests that the market is trying to tell us something. In fact the CAB examiners back in 1944 said that if somebody wants to get from a small town to a hub city, if you require him to stop 3 times on route to protect the local service carrier, he is going to drive. One of the original proposals made as an alternative to the every-stop, every-flight restriction that eventually was adopted was a limit on how far a local carrier could fly without stopping. Another proposal would have required a minimum number of stops but would have allowed the carrier the choice of how to fulfill the requirement you want to. But the Board didn't give the local carrier any flexibility. It was not until the early 1950's that the local carriers were even allowed to skip a stop on a particular flight if there was no reason to stop -- no passenger, cargo, or mail to be boarded or deplaned.

If you had an unlimited restriction on the kind of aircraft they could use I wouldn't expect everybody to set up a hub and spoke system. But a hub and spoke system is a very good one if you are operating basically a short-haul commuter system because that gets people to where they want to go quicker. You obviously would have certain linear routes if you had an unregulated system; we have had these in California.

(That kind where you have to make a stop regulation which is basically negative, basically trying to protect some end. You can

visualize some regulations which would encourage new kinds of service if the limitation or regulations was, say, on field length. Then the carrier could use any kind of airplane of that field length which would serve its purposes and maybe develop new markets.)

A: Certainly, but if you look at the whole history of regulation in every industry in which it has been tried you will see that the major purpose of regulation has been to protect someone. My view of the CAB proposal (S3460) is that it is a rare attempt at positive regulation. The Board admits that it's for political reasons we have decided to have a subsidy. Congress wants it so the question is how are we going to do it in the best way? And it is not designed for protection. It explicitly avoids protection. That's why I support it to the extent I do. The only type of route protection I would be in favor of is a one-time, limited, non-renewable certificate. In the book I suggested a duration of five years. When someone sets up a route, give him a certificate that gives him an exclusive franchise for only five years. If he can't defend that route on the basis of five years he isn't doing a good job. I have now changed my mind and would reduce the five year duration to two or three years. That is enough. Such protection would be almost like a patent grant and would provide an incentive for an operator to make the capital investment necessary to develop a route. But I oppose any form of permanent protection. One of the most powerful spurs to efficiency is the threat that if you get sloppy, someone will come in and take over your clientele. This has

happened in some cases -- I understand this is what happened in Executive's case. And I would be reluctant to abandon that spur to efficiency. It is one thing to provide someone with an incentive to take a chance at establishing a business. It is something far different to give him a permanent claim to that business, regardless of how he performs.

Suppose Joe Smith sets up a grocery store in a small town where there is a limited business and where there has not been a store previously. Assume that to encourage him to set up, the townspeople have agreed not to patronize for a period of five years any other grocer who happens to set up in the town. That would seem O.K. to me. I don't think that the townspeople would ever agree -- nor should they agree -- to a perpetual monopoly just to protect Joe Smith from competition. If he can't defend his market after five years of protection, then he isn't doing a good job. (If Sam Jones can successfully drive out Joe Smith after the five years is up due to lower prices and better services, he should not get a monopoly franchise -- the purpose of the monopoly is to allow the existence of the market to be tested, and that already has occurred. Furthermore, if in the competitive struggle between Jones and Smith both go bankrupt, the community should not be expected to offer a new monopoly to Adams, a third grocer, if he were to set up in the town. Smith's successful existence over five years has shown that a market does exist and the struggle between Jones and Smith has shown that the market is a natural monopoly. While Adams will have some monopoly power due to this fact, the community should

not give him absolute legal protection from entry as this destroys his incentive to limit his advantage to that confined by the natural monopoly).

The same reasoning applies to an air taxi operator seeking to set up a route in a community that does not now have air service. The grant of limited, temporary monopoly might be reasonable, but not so a permanent one.

(What do you think of protection against a financial concern moving in and undercutting?)

A: Well, we are talking about markets that in most cases will generate fewer than 7500 passengers per day, so the financial incentive for some big firm to move in and take over would be pretty small.

*(Tape ran out here -- I think the question was something like the following)

(What about some big firm like ITT setting up a nationwide network of air taxis?)

A: The only thing that would worry me is if ITT could do this and get some form of permanent route protection. If ITT is unprotected and they set up a nationwide service -- ITT Internal Commuter Air Service -- and they succeed because of their ability to schedule aircraft more efficiently and have computerized reservations, then I see no problems. Let me say, I don't believe they would be able to do it. We have already heard about the problems PSA has competing with United. I have a feeling that a local operator concentrating on the needs of the local community could generally beat them out -- unless they were protected.

The ability of large firms to be successful at being "predatory" where entry remains easy is open to serious question. Standard Oil was long felt to have been a successful "predator" and indeed, it did buy up lots of firms. What would happen is that somebody would set up a refinery next to John D. Rockefeller's refinery and John D. would buy them out. They would take their cash, go away, somebody else would come in and John D. would buy them out. John D. was constantly funnelling money to small operators. And if you look at what actually happened he was not successful in predatory practices. As long as we have an opportunity for free entry I am not worried.

(We had an example down in Miami - Bahamas area. Joe Mackey sold his whole operation to Eastern and 5 years later he's got a big going operation down in the same area.)

The final thing I want to talk about is on this connection between regulation and safety. You can see the argument that we need economic regulation, somehow, in order to make air carriers safer. It reminds me of an argument that somehow Cadillac drivers should be more safety conscious than people who drive VW's. Sort of a "trickle down" theory in the extreme. Make people rich, then they'll spend enough money on safety. Also if you believe that you would expect that during periods when the trunk airlines make less than the normal rate of return, as they have in the past several years, the accident rate should go up. We don't observe that. Airlines are safe because if they're not safe they go out of business. And they're not out of business because the government puts them out of business but because nobody flies on them.

Bill Jordan's study of the California case supports that very nicely. PSA has been very safety conscious, because it had to be. I do not accept the "regulation equals safety" argument. It could well be that the air taxis do need to be safer. I understand that the National Transportation Safety Board is now in the last stages of an investigation to change the rules under which air taxis operate and it is felt that somehow stronger rules are needed. Fine. Let, for example, anyone convicted of a violation be subject to a criminal penalty. Right now he pays a fine -- he's not subject to criminal penalties. Let's hire some more inspectors. Let's watch out, though, for the sort of thing like the rule that any plane with more than 19 seats has to have a stewardess. I cannot see what having a stewardess on a Twin Otter has to do with safety. If it's to keep the passengers seatbelts buckled, I am sure that they can put on the Twin Otter the sort of thing that's put on the car I rented to come up here -- If the seat belt's not buckled, a light flashes on the dashboard. If an airline wants to put a stewardess on, they should be allowed to, but to say that they have to carry around 120 lbs. of dead weight all the time is confusing economics and safety.

(Back to your comparison of the Cadillac and Ford. The guy in the Cadillac is a little safer in some respects because he has good tires or can afford them. Whereas maybe the guy, not in a VW but a 1968 Chevy or something, maybe has slicker tires. Maybe the little guys need a certain amount of safety equipment in terms of avionics and navigation which in some cases can exceed the cost of the aircraft.)

O.K., require that. If that is the price of having safe air service, if somehow the public decides this, then we will raise the price of entry.

(But unfortunately the cost of the avionics isn't in proportion to the size of the airplane and so the other operators perhaps cannot afford.)

What you're saying is that in certain markets, economics will not permit air service. You're not saying somehow give these people monopoly rights and somehow make them wealthy enough and they will be safe. What you're saying is that in certain places, air service is not viable. And I'll accept that.

(I think to a large extent air safety regulates itself independent of economics for an airline because of publicity that an accident gets, If you get down into the automobiles and smaller aircrafts.)

Your little commuter aircraft would get a lot of publicity for the area that's relevant to them, namely, where they serve. If a commuter air carrier crashes out in Kansas it gets a lot of publicity out in Kansas. It doesn't get publicity in Washington, D.C., but that isn't where the passengers come from. If it loses its passengers out of its home community the fact that it can't pick up some businessman who hasn't heard of its record doesn't matter much; it's out of business. It's really questionable that we want commuter carriers to have the same level of safety as the larger carriers. This could be one thing that people have to make a decision on. All you're saying, again, is that air service is not viable.

(No, I'm not. I'm saying they can only establish a certain level of safety. It has nothing to do with whether it's viable. It has to do with the number of people that will accept that level.)

O.K. If you require all air taxis to have automatic landing systems and make each plane cost several million dollars, the fare you'd have to charge is very high. All that says is that people are going to drive rather than fly.

(I think the question is somewhat different. I think the question is how much safety is enough safety. Because safety has a cost.)

Right. I would hope that the National Transportation Safety Board would just recognize that safety has a cost and that certain safety features may not be worth the cost.

(First, commuter carriers have a higher accident level than trunk carriers. This could imply they are less safe; it could also imply they fly in less safe areas. All commuter airports are less than International or Boston. It's a system safety. It's the same analogy that Nawal was referring to where ICAO airlines have a much worse accident record.)

The relevant question is would two carriers operating identical systems, one regulated and the other unregulated, have different safety records? I would say there would be virtually no difference.

(What are the prospects for the idea that route limitation have some kind of a time limit on it?)

I've seen it bandied in a new DOT staff report. I think it's mainly because I've talked to some people over there. I'm really

not that keen on any form of route protection. This would be the maximum I would be willing to go and I think DOT feels something of the same. The problem is, of course, that maybe what will happen is that enough commuter carriers will get together and generate political pressure for permanent route protection. That's the way things get done. But I would hope there would be some realization about the effect of route protection and that's the reason I published the book.

(The three year business reminds me of the TV license -- three year renewable.....all of a sudden you're in FCC operation.)

I recognize that -- all I was saying is that it would be the outside limit.

(You said 5 years -- then you said you would prefer 2 - 3 years, It's interesting that Air Midwest has told us that 2 - 3 years is all that's necessary to establish their new airline in a new city. It takes them that long to get up to the point where they can operate.

That's why I went to 2 - 3 years in my discussion with commuter air carriers. That's about how long it takes to be established. It takes someone else 2 - 3 years to build up their identity.

(....certain level of increased business...much higher rate of increase.)

I put very strict limits on this because the cost of giving someone a monopoly is his inefficiency. I have documented quite well in the case of local service carriers, the cost to the economy of having given the local carriers effective route protection. We have put a

1 billion dollars of subsidy into these carriers and we have not got an
efficient short-haul service -- we've gotten eight new trunk lines
which we could have gotten free for handing out eight pieces of paper.

1

1

1

N73-32899

THE RIGHT TO REGULATE

by J. F. Vittek
Deputy Director
Flight Transportation Lab
M. I. T.

July 19, 1972

Abstract

An introduction to the historical and constitutional framework of industry regulation by local and federal governments. Problems of the confiscation of private property without due process, government control and the rights and duties of the regulated industry will be discussed.

THE ROLE OF GOVERNMENT

Government regulation of industry takes many forms. At the most indirect level, government creates a stable setting for social development. Once a society is secure, it will evolve a code of morality and ethics to guide the actions of its members. This social code is a type of regulation since it outlines how individuals are expected to act toward one another, and how businesses are to conduct themselves toward individuals and the community.

Government also indirectly regulates industry by providing a legal structure for the resolution of private disputes. The rules developed by the courts to determine who breached a contract and how much they should pay are forms of regulation.

Through the passage of criminal laws and administrative orders, a government takes a more active role in regulating business conduct. To protect the social order certain activities are forbidden. For example, price fixing or monopolistic practices are made illegal to protect the public from the evils of reduced competition. Finally, the government may compel businesses to do certain things that they might otherwise choose not to do. This is the most direct type of government regulation and is used to develop social policy in an active way.

Requiring a certificate of public convenience and necessity before a company can offer interstate air service between two points; or setting the price that can be changed for particular goods or services are examples of positive government control.

HISTORY OF REGULATION

The regulation of business has gone through several stages of historical development. Although there is evidence of a highly sophisticated system of government regulation of business and transportation in China as early as 300 B.C., the concept of positive control of private business practices emerged slowly in the western world.

During the Roman era, business activities were governed by the "fair price" doctrine. The price was any price on which the parties freely agreed without fraud, coercion or the like. Transactions were bargained for with what we now call supply and demand playing the major role in setting the final price.

This concept was modified during the early Christian era, and eventually replaced by the "just price" doctrine. Since the true reward of the Christian occurred in the next world and not this one, he was not supposed to be concerned about money. Rather, the Christian businessman was to treat all men fairly, charging only what was necessary to cover the basic needs of the merchant and his family and not what would maximize his profit. This rationale applied at all times no matter what

the supply and demand situation was. Even in times of great scarcity the merchant could only charge the "just price."

During the same period, the Guild System evolved. Guilds were craft-unions with limited entry. Each profession had its own guild and one could not practice or even learn a profession outside the guild. In return for the job security that the guild system provided, members were required to offer their services to all customers who were willing to pay, a concept retained in the later English law of the "Common Callings."

The next major development in the regulation of business was the evolution of the royal charter. The King or Parliament would create a monopolist corporation to carry out some specific project or task. Charters were very detailed about how the companies could operate, what they were to do and what the duties of the corporations were toward the public.

The last major inputs that helped shape our present regulatory system were the concepts developed by the English Common Law, the antecedent of our own legal system. Some of the basic ideas predate the Norman Conquest in 1066. These were developed on a case by case basis by the courts into a rather complete system of court enforced business regulation.

Four major areas of control developed. The first three were the definition and prohibition of certain practices: restraint of trade, illegal monopoly, and unfair competition.

The fourth area of regulation was the classification of certain trades as "Common Callings" and the detailed specification of what people who followed these professions could and could not do.

Common Callings were professions essential to the public such as bakers, brewers, millers, cab drivers, ferry men, innkeepers, smiths, surgeons, tailors, and warfingers. Since these professions tended to have at least limited monopolies in time or space, and since they were essential to the general welfare, the public required protection from exploitation. Therefore, those following a common calling were required to offer their services at a just and reasonable rate to anyone who wished to employ them.

An additional burden was placed on the innkeeper and those engaged in transportation. Since their customers were often far from home and the opportunity for collusion between the innkeeper or cab driver and local bandits was high, the courts imposed an absolute liability on these trades to protect their clients from harm.

During the Colonial period of the United States, the common law doctrines became the basis of the American legal system. But further regulatory measures were not developed for many years. In general, both federal and local governments adopted a laissez-faire policy until the end of the 19th century.

Rapid industrial expansion was desired and government intervention in business activity was minimized to allow maximum development.

The laissez-faire policy was slowly eroded under the political pressures of the Grange movement. The period from 1850 to 1870 had seen a rapid expansion of the railroads both in number and area served. This led to intensive competition between major centers of shipping and commerce with freight rates in these markets often falling below out of pocket costs. These deficits were covered by charging high rates on sections of the system that were monopolistic--generally lower density farm markets. Often the cost of transporting farm products a relatively short distance were greater than those charged for industrial shipments of many hundreds of miles over competitive routes.

Since the majority of the nation's population was still rural at that time, the protests of the farmers directly and through their Grange association was a potent political force. One by one, the states adopted measures to regulate railroad rates and practices.

Finally, in 1887, the Act to Regulate Commerce was passed creating the Interstate Commerce Commission, the first of the federal regulatory bodies. In its initial form, the commission

had little real power. And what power it thought it had was gradually eroded by court decisions. However, Congress passed additional legislation in 1906 and 1920 that gave the ICC the powers it needed to rule on the validity of rates and actually set them where required. Since that time, there have been few serious challenges to the federal government's role in transportation regulations.

SOURCES OF POWER

At the state level the powers to regulate business activities are based on state constitutional requirements that government protect the health and welfare of the citizens. Through ratification of the state constitutions the people agreed that government could perform these functions for the overall good.

Federal powers must also be based on Constitutional standards. However, in the federal constitution there is no broad delegation of power to act in the public good. Only very specific powers which each independent colony was willing to yield to the national government are enumerated. And powers not specifically delegated are retained by the states. Therefore, all federal legislation must be based on one of the powers enumerated in the federal constitution.

There are cases where both the state and federal government can theoretically regulate an activity. In these cases,

it is often difficult to decide if both can regulate or whether one must yield to the other. The nature of the activity and its national impact must be considered to decide this issue.

If the activity to be regulated is so national in scope that local regulation would only cause confusion, then the federal power is said to be exclusive and state action is barred. The courts have made this distinction even when the federal government fails to regulate. No regulation is thought better than varied local controls. Air traffic control is an example of an exclusive federal power.

Federal power is said to be "paramount" if state action is allowed as long as Congress has not acted. There is presently a great deal of legal debate whether the control of airport noise is an area of exclusive or paramount federal power. If the former, then all present and proposed state laws regulating airport noise are unconstitutional. If the power is the latter, then state legislation will stand until Congress decides to create a national plan.

At this point it is worth noting that the Courts decide what kind of federal power exists, and not Congress. Thus, if the United States Supreme Court holds that the regulation of airport noise is exclusively in the federal sphere, the Congressional statements that local control is permissible under Public Law 90-411 is invalid. Congress cannot delegate

a power to the state which is exclusively federal.

Powers are "concurrent" when both state and federal governments can regulate at the same time. An example of this is the power to tax which both possess.

Finally, there are areas where the states alone can act. For example, the federal government cannot pass a statute making homicide a federal crime unless it is done on federal land or perhaps involves a federal official. Otherwise, the power to pass such laws is exclusive to the states under their duty to protect the welfare of their citizens.

THE POWER TO REGULATE COMMERCE

Under the federal constitution, Congress is given the express power to regulate commerce among the states. In the exercise of this power, two questions must be considered: What is "commerce among the states?", and is the regulation so severe as to amount to a deprivation of property without due process under the fifth amendment?

WHAT IS COMMERCE?

The definition of commerce among the states is ever evolving through court decision. One of the earliest cases was *Gibbons v. Ogden* (9 Wheat. 1, 1824). The legislature of New York had given an exclusive charter for the operation of steam boats on waters of the state. Ogden, who had been

assigned this charter sued to stop Gibbons from operating a steamboat between New Jersey and New York City. The U.S. Supreme Court held the exclusive grant of the New York legislature to be unconstitutional. Since the boat passed over the state line, it was in interstate commerce during its entire trip. In attempting to prohibit the ship from using New York waters while on an interstate voyage, the state had attempted to use a power granted to the federal government.

In the 1870 case of *The Daniel Ball* (10 Wall. 557). The steamer was used to transport goods on the Grand River, entirely within the state of Michigan. However, some of the goods the *Daniel Ball* carried were destined for other states or had come from other states. Based on this, the Court declared the *Daniel Ball* was operating in interstate commerce and was, therefore, subject to federal regulation.

The finding of the court in *The Daniel Ball* is one of the reasons Pacific Southwest Airlines (PSA) does not accept interline tickets or baggage. Their passengers must make a distinct termination of interstate service, buy new tickets, and start an intrastate trip. Thus, PSA is not subject to the economic regulations imposed on interstate carriers.

The extremes to which the Court will go to find interference with interstate commerce and therefore federal

jurisdiction are quite interesting. An example is the 1942 case of *Wickard v. Filburn* (317 U.S. 11). Mr. Filburn grew corn in excess of his quota imposed by Wickard, the Secretary of Agriculture. Although all the excess corn was consumed on his farm, Filburn's acts were held to affect interstate commerce. If he had not planted so much, he would have had to buy corn on the market. The test was not so much the effects of an individual act, but the cumulative effects of many farmers acting the same way.

Perhaps an even more extreme case is the case of *Katzendback v. McClung* (379 U.S. 294, 1964). McClung operated a diner in Alabama. Under the Civil Rights Act of 1964 (42 U.S.C.A.

2000 et seq.), Congress outlawed segregation in any place of public accommodation. A restaurant was a place of public accommodation under the Act, if it serves or offers to serve interstate travelers, or a substantial portion of the food it serves has moved in interstate commerce.

The trial court found that McClung did not treat whites and blacks equally. It also found that 46% of the meat served in the restaurant had been purchased from a local supplier who had in turn purchased it in interstate commerce. But the trial court held that the act was unconstitutional since there was no demonstrable connection between food purchased in interstate commerce and sold in a restaurant and the conclusion of

Congress that discrimination in the restaurant would affect that commerce.

The Supreme Court upheld the constitutionality of the act. On the strength of *Wickard v. Filburn* (above), they held that Congress could regulate intrastate matters if there was an overall impact on interstate commerce and that there was evidence in the Congressional hearings that segregation in local restaurants serving interstate food could have an interstate impact. The Supreme Court then said:

"But where we find that the legislators, in light of the facts and testimony before them, have a rational basis for finding a chosen regulatory scheme necessary to the protection of commerce, our investigation is at an end. (p.303) "...The Civil Rights Act of 1964, as here applied, we find to be plainly appropriate in the resolution of what Congress found to be a national commercial problem of the first magnitude. We find it in no violation of any express limitations of the constitution and we therefore declare it valid." (p.305)

In summary, the courts have defined what affects interstate commerce very broadly, and Congress by basing its action on the Commerce clause has been able to pass a great deal of legislation concerning the general welfare of the nation's population.

HAS THERE BEEN A VIOLATION OF THE FIFTH AMENDMENT?

Under the fifth amendment to the United States constitution, "No person shall be. . .deprived of life, liberty or property, without due process of law; nor shall

private property be taken for public use without just compensation." (Emphasis added.) The 14th Amendment extends this theory to the actions of state governments. When the government regulates a business, it interferes with the use of private property. The questions are whether the interference amounts to such a deprivation that due process has been violated or that compensation was required but not paid.

One of the earliest cases to raise these issues was *Munn v. Illinois* (94 U.S. 113, 1877). The state legislature had passed a law regulating grain elevator operators in the city of Chicago. Munn was one of 14 such operators through whose plants most of the midwest's grain had to pass. Munn failed to comply and defended his action on the basis that his business was his private property on which the government was imposing a burden.

The U.S. Supreme Court found that government interference with property rights was justified under certain instances and did not violate constitutional standards.

"When . . . one devotes his property to a use in which the public has an interest, he, in effect, grants to the public an interest in that use, and must submit to be controlled by the public for the common good, to the extent of the interest he has created. He may withdraw his grant by discontinuing the use; but, so long as he maintains the use, he must submit to the control." (p. 125-26)

The basis of holding grain storage facilities to be "affected with the public interest" seemed to be the virtual monopoly position they held in the Chicago market. This established the economic condition of monopoly as the basis of broad regulation.

In 1894, the Supreme Court again addressed these issues in *Brass v. North Dakota ex rel. Stoeser* (153 U.S. 391). Again, the state passed a law regulating grain storage operators. But now there were 600 elevators controlled by 125 operators. There was no actual or virtual monopoly on these facts. The court, however, felt that the principle of regulation by state legislature should be upheld, even though the facts were different.

"When it is once admitted, as it is admitted here, that it is competent for the legislative power to control the business of elevating and storing grain, . . . in cities of one size and in some circumstances, it follows that such power may be legally inserted over the same business when carried on in smaller cities and in other circumstances." (p.403)

The test does not seem to be monopoly, but the very nature and public need for the services.

In *German Alliance Insurance Co. v. Lewis* (233 U.S. 389, 1914), the Court allowed regulation of fire insurance, since it was "practically a necessity." Thus neither monopoly or public need were mandatory to grant regulatory policy.

The last attempt of the Supreme Court to define when an industry is so affected with a public interest as to permit

regulation was *Nebbia v. New York* (291 U.S. 502, 1934). The case concerned the regulation of the competitive milk industry. After agreeing that there was no monopoly, the court went on to say:

"So far as the requirement of due process is concerned, and in the absence of other constitutional restriction, a state is free to adopt whatever economic policy may reasonably be deemed to promote public welfare, and to enforce that policy by legislation adapted to its purpose." (p.536)

and further,

"If the laws passed are seen to have a reasonable relation to a proper legislative purpose, and are neither arbitrary nor discriminatory, the requirements of due process are satisfied. . . ." (p.537)

Note the similarity in thought and language to the Court's definition of powers under the commerce clause in the *Katzenback* case. In summary, the state and federal governments both have broad regulatory authority from the public welfare and commerce clauses of their respective constitutions, with little review by the courts. What then holds these powers in check?

Since most regulatory statutes set up administrative agencies to administer them, state and federal Administrative Procedure Acts impose procedural safeguards on the operation of the agency. People to be regulated must be told of pending

regulations, given an opportunity to present their side of the case, and finally have rights of court appeal from arbitrary action. The courts often use violations of these procedural requirements to block policy decisions.

Secondly, the people through the elective process have some control over legislative action. In the last analysis, this is the only adequate check on over-regulation and excess government control of activities.

WHEN IS REGULATION IMPOSED?

The basic impetus to regulation is the political process. Thus, the first step in regulation occurs when some public or special interest group demands regulation and has enough political power to exert pressure on its representatives.

The second step occurs when the legislature agrees that regulation is needed and in the best interest of the people. It will then enact the needed legislation.

After legislation is passed, it is likely to be challenged in the courts on any number of points. Therefore, the regulation is not final until the courts recognize the need and approve of the legislative approach.

THE RIGHTS OF A REGULATED INDUSTRY

Even though regulation is imposed on an industry, it is not deprived of all its rights. The regulated industry has a right to earn a reasonable return on its investment so that

it can continue to grow and attract investors. However, the right to a reasonable return is not a guarantee. If management is inefficient, the government is not bound to grant rates high enough to affect inefficiency.

The industry is also able to impose reasonable rules and regulations on the service it supplies. Although it is affected with a public interest, it is not obliged to respond to every whim of the public it serves.

Finally, in many cases the industry is given protection from competition through government control of entry into markets. Since the industry must provide certain services to the public under all conditions, it is protected from competitive forces that might restrict its ability to perform.

THE OBLIGATIONS

Like the Guilds and the Common Callings, a regulated business must serve any customer willing and able to pay. They must also offer safe and adequate services and charge a "just and reasonable" price. (What is "just and reasonable" is the topic of the paper on Basic Rate Making.)

Finally, the regulated industry must avoid unjust or unreasonable discrimination.

There are several types of discrimination, not all of which are unjust or unreasonable. They can be classified as:

1. Personal - The charging of different rates to different persons (or companies) for the same service. For example, a non-standby youth fare.
2. Commodity - The charging of different rates for different commodities not proportional to the different cost. An example would be higher charges for manufactured goods than for bulk commodities of the same weight.
3. Place - The charging of different rates for the transportation of the same commodity and level of service over different distances not justified by costs alone. The treatment of farmers on monopoly segments by the railroads before the Grange movement was place discrimination.
4. Temporal - The charging of different rates for the same service at different times, e.g., peak-hour premiums or off-hour discounts.

It must be noted that not all of these are illegal even though each is a form of discrimination.

SUMMATION

Both federal and state government have great powers to impose rules and regulations on the conduct of businesses. The sources of these powers are historical and embodied in constitutional provisions at both national and state levels.

Certain duties can be imposed on regulated businesses that are not imposed on free enterprise in general. However, the regulated industries are granted special privileges in return. These duties and privileges result from a balancing of the interests of the general public and the entrepreneur who engages in a business "affected with the public interest."

N73-37890

BASIC RATE MAKING

BY J. F. Vittek
Deputy Director
Flight Transportation Lab
M. I. T.

July 19, 1972

Abstract

A description of how rates are set. Topics include the determination of a fair rate of return, the rate base, allowable expenses, load factors, and seating configurations.

It is conceded that the government has broad powers to control the economic policies of certain industries, including the power to fix maximum, minimum and exact rates and fares. The Civil Aeronautics Board has rarely actively used this power, preferring to rule on the reasonableness of rates filed by the carriers on a case by case basis. However, the General Passenger Fare Investigation of 1960 and the present Domestic Passenger fare investigation, indicate that the Board will probably take a stronger position on rate regulation in the near future.

The Rule of Ratemaking

In the 1960 G. P. F. I., the C. A. B. decided to adopt the traditional ratemaking process used to regulate railroads and public utilities. The present D. P. F. I. is settling issues of how the traditional approach should be applied to the air industry. The "Rule of Ratemaking" sets out those factors that the Board must consider in establishing its regulatory policy.

The factors are:

1. The inherent advantages of air transportation
 2. The potential effect of the rate on the movement of traffic
 3. The quality of service to be offered at the rate to be established
 4. The public need for efficient and adequate air transportation at the lowest reasonable cost
- C4
- C4

5. The carrier need for sufficient revenue to operate the service under efficient, honest and economical management

Revenue Requirements

Under the utility theory of rate making, total revenue requirements are computed as follows:

$$R = OC + (V-D)r$$

Where:

R = Revenue Requirement

OC = Operating Costs

V = Gross Value of Investment Property

D = Accumulated Depreciation

r = Rate of Return

The total revenue should cover the operating costs and yield a sufficient return on the value of the investment to attract and hold new sources of finance. The term (V-D) is often referred to as the "Rate Base" which represents the value of the present investment. Hence, this approach is known as the "Rate Base Method" of rate determination.

Operating Costs

The operating costs category can be broken down into three subcategories.

1. Out of pocket operational expenses
2. Depreciation of property
3. Local and Federal taxes

Problems are often encountered in determining what items should be included in each subcategory, especially 1 and 2. Usually, the rate making authority will allow business expenses that result from arm's length bargaining between the firm and its suppliers in the exercise of managerial judgement. Management is not held to a standard of perfection, but costs arising from inefficiency, improvidence or extravagance will not be allowed into the revenue calculation.

What costs will be allowed vary from one industry to another. The monopolistic utility industries probably have the tightest cost restrictions. Although the costs imposed by the regulatory process are usually allowed, many areas are disputed. For example, funds expended for dues to trade associations, advertising and promotional costs and public relations expenditures are closely watched. So are the salaries and benefits of executives, and charitable contributions and donations.

Depreciation

From a bookkeeping standpoint, there are several acceptable ways of accounting for depreciation of assets. Likewise, there

is some freedom in assigning a useful life to an asset, and its residual value at the end of the depreciation period. Thus there are many combinations of techniques that could be applied.

To avoid confusion and promote uniformity, the regulatory body will determine what technique shall be used for rate making purposes. This does not mean that the industry is compelled to use the specified depreciation scheme for all purposes. On the contrary, the company may use one technique for regulatory matters, another for its internal use and perhaps a third for tax purposes. But all companies filing with the regulatory commission will use the same technique, life time and residual value for similar types of property.

Depreciation actually enters the revenue equation twice. In addition to being an allowable cost, it is used to decrease the value of the rate base. As the asset is used up, the company's allowable return is lessened.

The Rate Base

The determination of what assets are to be included in the rate base has been a fruitful area for lawyers and economists because of the great deal of litigation it creates. In general, the rate base can include any assets used and useful in the operation of the business. These may include all kinds of current, fixed or intangible assets. However, not all assets of all types are allowed.

Duplicate and unnecessary property is excluded. Property that is obsolete and abandoned must be dropped from the rate base. If the property is held for non-transportation purposes its value cannot be included. Finally, rented or leased property is not includeable in the rate base. Rather, the rental fees paid would be deducted as an operating expense.

Valuation

Once the decision is made as to what can be allowed in the rate base, the agency must decide how it should be evaluated.

Many approaches have been tried. For example:

1. Original Cost - what was originally paid for the item
2. Reproduction Cost - what it would cost to replace the asset at the present time
3. Prudent Investment - That portion of the original cost that was not frivolous or unnecessary
4. Market Value - what the asset would bring if sold

Since the mid-1930's, the courts have allowed the agencies to impose any reasonable rule on the industry. This is the "End Result Test" stated in *Federal Power Commission v. Hope Natural Gas Co.* (320 U.S. 591, 1943).

"It is not theory but the impact of the rate order which counts. If the total effect of the rate order cannot be said to be unjust and unreasonable, judicial inquiry under the Act is at an end. The fact that the method employed to reach that result may contain infirmities is not then important."

Rate of Return

The change in the allowed rate of return from 4% to 5% would have the same effect on the revenue equation as 20% upward evaluation of the rate base. But although there has been a great deal of discussion and litigation over a few percent difference in rate base computations, there is curiously little debate over the rate of return.

In general, the rate cannot be confiscatory. That is, it should not be so low as to seriously deprive the investor of the revenues from his property. Yet it is not a guarantee. The rate of return is an industry standard which some firms may surpass and some never reach. And since industry conditions change, the allowable rate of return must be adjusted over time.

In general, the agency must balance the needs of the consumers against those of the investors. It must also consider the relative interests of the debt investors and the equity investors.

In evaluating the rate of return needed to attract debt investments, the agency uses the "cost of capital" standard. That is, the regulated industry must be able to attract capital on terms that will:

1. Maintain its credit standing
2. Protect the financial soundness of the firm
3. Maintain the integrity of presently outstanding debt investment

Equity owners, on the other hand, are interested in the "comparability of earnings". Their return should be commensurate with those from firms with similar risks.

When the commission determines the returns needed to attract debt and equity credit, it must look at the rate of debt/equity financing to determine the overall return needed. Table 1 shows how the overall cost of capital fluctuates with the change in the debt/equity percentages.

Price Structure

Once the factors in the revenue equation have been selected, the overall financial need of the industry is computed. The regulatory body must then examine the price structure to see if it yields the proper amount of revenue. If not, the agency can establish various price guidelines.

Minimum Prices

The establishment of minimum prices that can be changed for given goods or services has several economic results. First, it protects the industry from competitive price cutting. It may also provide protection from exploitation if the buyer is a superior economic force. (Minimum wage standards are an example of protective minimums).

COST OF CAPITAL

	% CAPITAL STRUCTURE	ANNUAL COST	WEIGHTED COST
BONDS	50%	7%	3.5%
STOCK	50%	9%	4.5%
OVERALL COST	100%		8.0%
BONDS	40%	7%	2.8%
STOCK	60%	9%	5.4%
OVERALL COST	100%		8.2%
BONDS	60%	7%	4.2%
STOCK	40%	9%	3.6%
OVERALL COST	100%		7.8%

TABLE 1

Minimum price standards also effect the supply and demand of the quantity. As Figure 1 shows, in a free market, supply and demand would be in equilibrium at price P and quantity Q . When the price

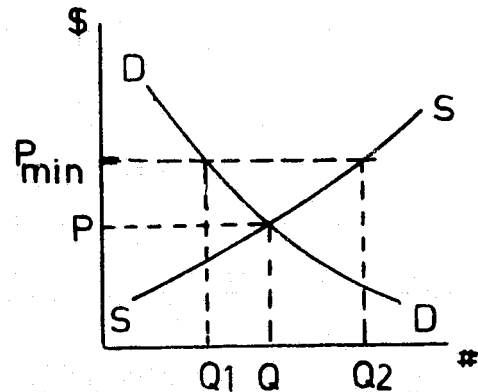


FIGURE 1

is raised to P_{min} by the regulatory agency, demand is reduced to Q_1 . If supply is controlled, this could be used as a way to conserve scarce resources. However, if supply (or capacity) is not controlled, the producer will increase his output to Q_2 creating excess supply. This effect can be observed in the farm subsidy program where farmers attempt to get maximum output from their assigned acreage.

Maximum Prices

The major reason to set price maximums is to protect the consumer from exploitation. However, there are several important economic effects that must also be considered. In Figure 2, supply and demand would dictate a market for Q of a good at price P . The suppression of the price to P_{max} will induce producers to

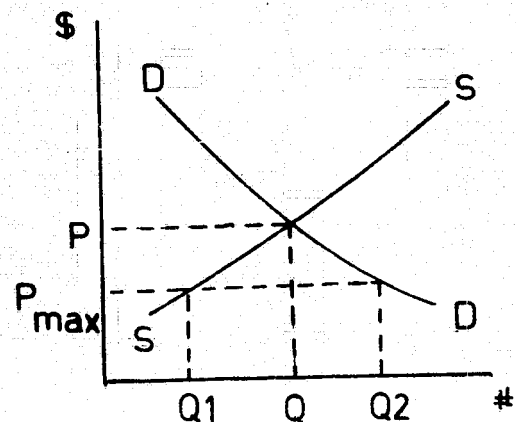


FIGURE 2

supply less (Q_1), while increasing demand to Q_2 . Since price no longer controls the market, some rationing scheme must be devised.

This could be used as a technique to limit production of a product using scarce commodities, or as a way of diverting production resources to other areas since the supplier will look for new products as his market decreases.

Exact Rates

Finally, the agency could specify the exact rate to be charged for particular goods or services. In this case, the regulator substitutes its decision for the market.

Any such decision must be based on the average industry cost structure. This results in excess profits for the low cost efficient producer, while the inefficient producer may be forced out of the market. In a competitive market, the loss of the inefficient producers would diminish supply. As a result, price would go up, the efficient producer would produce more, and price would come back down until equilibrium is attained.

However, since the price is fixed, the efficient producer may not be induced to increase his output when the inefficient suppliers leave the market. This could result in the same situation as the setting of maximum prices.

Pricing Problems

The cost structure of any industry can be divided into the direct costs of producing a product or service, and the indirect costs of supporting the general administrative aspects of the firm. Any allocation of the indirect costs to the price charged for the product must be arbitrary since they are really not directly related. The scheme itself may not treat products arbitrarily, but the selection of the scheme is. For example, indirect costs could be proportioned on the basis of percent sales, or percent direct cost, or according to a number of other reasonable formulae. But management is free to select whatever basis of allocation they feel best suited to their firm.

Therefore, when an agency regulates an industry with more than one product, it must somehow allocate the indirect costs to those products when it sets a price. Several techniques are used.

Cost of Service Pricing

In this method, the agency tries to allocate the indirect cost as part of the price according to some plans. The price would also include the direct cost component. Such an approach is best suited for setting minimum rates since at least direct costs must be covered for each product.

Value of Service Pricing

This technique is based on the theory that market demand may place a premium on some services in excess of actual cost. Thus, by putting more indirect costs into the price of these products, the agency lets demand allocate the distribution of the indirect cost component. Since no one will use the service if the rate exceeds what the market will bear, this method essentially establishes a maximum price.

There is a variation of the value of service method called value of commodity pricing which is sometimes discussed. Thus, a high value product pays a high rate. Since the only possible economic justification for this is the additional risk the carrier incurs from potential damage, the method has fallen into disuse.

Public Policy

Finally, an agency may set rates on the basis of public policy rather than cost, feeling that the public interest outweighs economic efficiency. An example is reduced fares for the elderly on public transit.

Such a policy places the extra cost on the transportation company and ultimately on the other users.

Summary

Classic rate making is easily describeable, even though its implementation is often difficult and fraught with judgemental problems. How the CAB will resolve these issues will be seen at the completion of the Domestic Passenger Fare Investigation. Dr. Miller's paper will address the specifics of that investigation and what has been decided to date.

N73-32891

A CRITIQUE OF CAB REGULATORY POLICY*

by

James C. Miller III
Department of Economics
Texas A&M University

I was asked to do a critique of CAB regulatory policy,¹ and since I am a critic of the CAB, this might seem like a very easy task. However, when an economist broadcasts a critical evaluation of a government agency, there are several problems of communication and persuasion. First, not everyone has in mind the same criteria for judgement. The CAB is alleged to have several objectives: economic efficiency, equity, and other national goals. In my presentation on the 13th,² I tried to show that economic efficiency, if not an all-encompassing objective, should be an overriding one in most cases. Secondly, whenever anyone proposes an institutional change, there is not much experience to go on. For example, I read Paul Cherington's review of Bill Jordan's book.³ While I agree with Paul on some points, I think to criticize

*Presented at a Summer Workshop on "Air Transportation Systems Analysis and Economics," conducted by the Flight Transportation Laboratory of the Massachusetts Institute of Technology, and sponsored by the Office of Aeronautics and Space Technology, National Aeronautics and Space Administration (July 21, 1972). Portions of this presentation are excerpted from a study on airline regulation the author and George W. Douglas are preparing for the Brookings Institution. The standard disclaimer applies.

¹The scope of this paper is limited to economic regulation of domestic air transport by the U.S. Civil Aeronautics Board.

²"Determination of Fares: Pricing Theory and Economic Efficiency," this Workshop.

³Review by Paul W. Cherington of William A. Jordan, Airline Regulation in America: Effects and Imperfections (Baltimore: Johns Hopkins Press, 1970), Journal of Economic Literature (June 1972), pp. 496-7.

Bill for drawing implications about CAB policy from the PSA experience is merely to reveal that there are precious few cases of alternative institutional patterns in commercial aviation.

Moreover, economists who speculate about institutional changes often do not seem very helpful. I am reminded of a story Milton Friedman told during his AEA Presidential address.⁴ A physicist, a chemist, and an economist were marooned together on an island. They were starving to death when a can of spinach floated up on shore. The chemist claimed that if they put the can into the fire, he could predict the exact moment when the top would explode. The physicist claimed he could, at that moment, plunge his hand into the fire and point the can at the precise angle such that the spinach would describe a parabolic arc, terminating on the banana leaves spread on the ground near-by. The economist's contribution was "Let's assume we had a can opener." A lawyer would have asked, "To whom does the can opener belong?"

I. CAB Control over Rates

The Federal Aviation Act of 1958 gives the Civil Aeronautics Board control over airline rates and entry. After several aborted attempts, the Board held a General Passenger Fare Investigation over the period of 1956 to 1960. All they could really conclude from this effort was that the carriers were entitled to a 10.5 percent return on investment. They could not even determine the reasonable level of fares.

⁴Eightieth Annual Meeting of the American Economic Association, Washington, D.C., December 29, 1967.

The Board initiated the Domestic Passage Fare Investigation (DPFI) in 1970. Some work on this is still going on. The Investigation was divided into nine phases, as indicated in Table 1. The first three were rule-making proceedings, the rest were public hearings.

Table 1: Phases of the Domestic Passenger Fare Investigation
(CAB Docket 21866-1 through 9)

<u>Phase</u>	<u>Title</u>
1	Aircraft Depreciation
2	Leased Aircraft
3	Deferred Federal Income Taxes
4	Joint Fares
5	Discount Fares
6	Load Factor and Seating Configurations
7	Fare Level
8	Rate of Return
9	Fare Structure

Rate Level Issues

Cases involving rates are, by convention, broken down into issues involving rate level (or average yield) and rate structure (or the relationship one rate has to another). First, the rate level. The rate level issues in the DPFI are 1, 2, 3, 6, 7, and 8. Skipping 1, 2, and 3, we move onto 6, 7, and 8.

Essentially, the Board had to determine the connection between load factor and fare level. Should the Board control carrier load factors?

Can the Board control load factors? If they can control them, what is the optimal load factor? The presentation made by the Department of Transportation in the Investigation is consistent with what I presented on the 13th. That analysis is summarized in Figure 1.

As shown in the figure, there is a break-even load factor for each fare over a broad range of fare levels. Carriers can break even at a high fare and low load factor, or they can break even at a low fare and a very high load factor. The dynamics are that carriers, by competing with each other, tend to eliminate excess profits by reducing load factors toward the break-even load. On the other hand, if load factors are below break-even, carriers will tend to constrict capacity and drive load factors upward.

In decisions on phases 6, 7, and 8 of the Investigation, the Board went along with the controversial view we had advocated at DOT:

"In the Board's view, a policy of basing fares on actual load factors can only lead to increasing overcapacity, with the traveling public being asked to pay higher fares to compensate the carriers for the cost of operating an increasing number of empty seats. This result is virtually inevitable because schedules constitute the major competitive device of carriers in their efforts to preserve and enhance their participation in the traffic markets which they serve. In any given market, the carrier with the greatest number of schedules will normally carry the largest number of passengers. Thus, the desire to maximize market participation creates powerful incentives to add capacity. The countervailing incentive is supplied only by the imperative of economics: Schedules cannot be added indefinitely if the load factors achieved are insufficient, at the prevailing fare levels, to permit the carriers to cover costs and return a profit. But this economic incentive loses its force if the carriers are able to raise their fares to cover declining load factors. In that event, the pressure of competition to add schedules will become virtually irresistible and will inevitably lead to a long-term decline in load factor, rising fares to support higher levels of unused capacity, and, because of regulatory lag, a chronically depressed profit level for the industry as a whole."¹

¹CAB Order 71-4-54, April 9, 1971, p. 5.

Average Yield
(Fare Level)

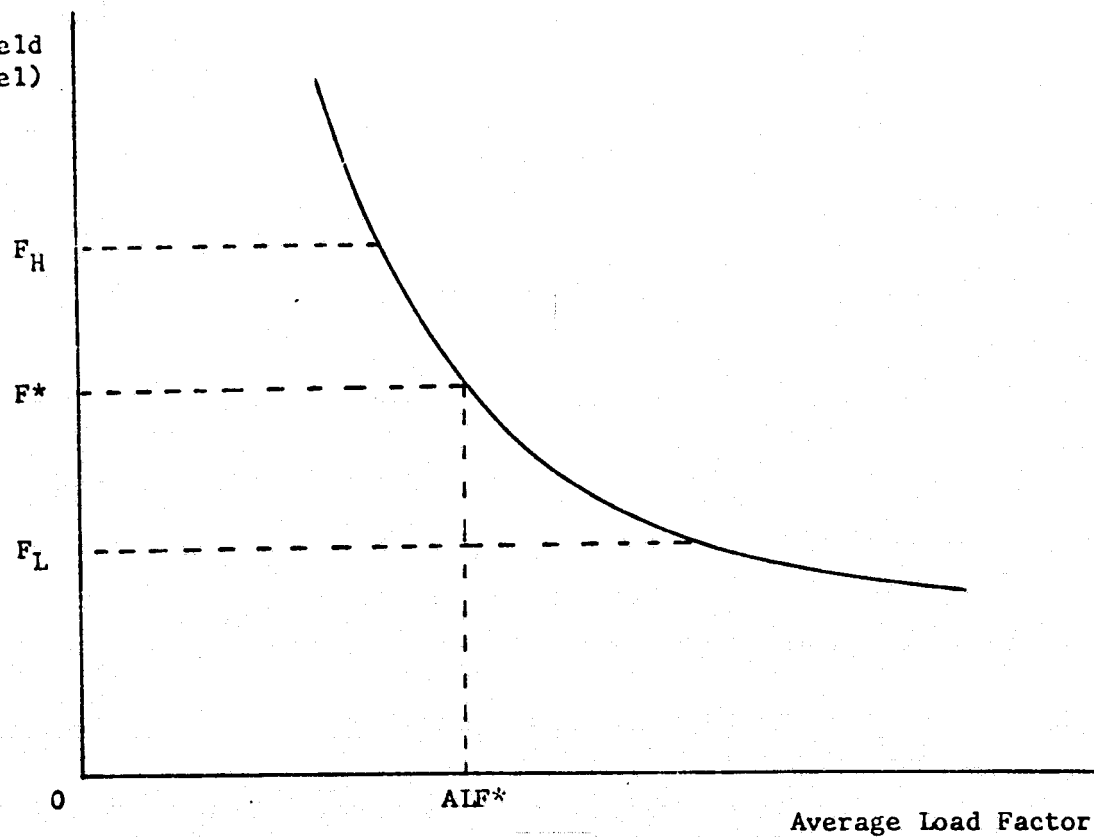


Figure 1

Source: CAB Docket 21866-7, DOT-RT-2, p. 12.

I have nothing but commendations for the Board in that decision. Eventually fares are to be established commensurate with a 55 percent load factor.

Let us now look at the question of return on investment. Table 2 summarizes the Board's position, the carriers' advocacy position, the Examiner's initial decision, and the Board's final decision. The Board came out with a 12 percent rate of return for trunk carriers, 12.35 percent for local service carriers, and based both on an "optimum" debt-equity ratio. Over the past years, especially the local service carriers have been increasingly financing their investment with debt rather than equity. Since debt is less costly than equity, this reduces the cost of capital. The decision was to ask the question, "What would be the carriers' cost of capital if the debt-equity ratio were commensurate with "sound financial management?" The effect of choosing the "optimum" rather than the actual debt-equity ratio is to give the carriers a higher allowable rate of return.

DOT made the argument that the Board really cannot fix carrier rate of return very well. If one believes the carrier competition dynamic, it stands to reason that excess profits will be eliminated --where "excess" is defined as a rate of return above that which the carriers themselves require. Essentially, by attempting to regulate rate of return the Board finds itself in the uncomfortable position depicted in Figure 2.

Suppose that in the figure R_1 is the load factor-average yield trade-off curve consistent with the carriers' perception of rate of return. Suppose R_0 connotes the Board's "entitled" rate of return. The Board now finds

Table 2

Proposed and Decided Rates of Return
(and Cost Bases) in Rate of Return Phase of the DPFI

<u>Position/Decision</u>	<u>Cost of Debt (in percent)</u>	<u>Cost of Equity (in percent)</u>	<u>Debt-Equity Ratio</u>	<u>Return on Investment (in percent)</u>
— Trunk Carriers' Position	6.63-7.60	16.00-18.00	40/60-45/55 ^{1/} (optimum)	12.25-13.50
— Local Service Carriers' Position	9.50	20.00-21.00	55/45 (optimum)	14.225-14.675
— Bureau of Economics' Position				
Trunk Carriers	5.70	16.00	58.9/41.1 (actual)	10.50
Local Service Carriers	--	--	--	11.50 ^{2/}
— Examiner's Initial Decision				
Trunk Carriers	7.00	17.00	60/40 (actual)	11.00
Local Service Carriers	8.50	30.00	88/12 (actual)	11.00
— Board's Final Decision				
Trunk Carriers	6.20	16.75	45/55 (optimum)	12.00
Local Service Carriers	7.25	20.00	60/40 (optimum)	12.35

^{1/} Counts convertible debentures as equity.

^{2/} Based on the Bureau's judgment that local service carriers are entitled to one percentage point in excess of the return for trunk carriers.

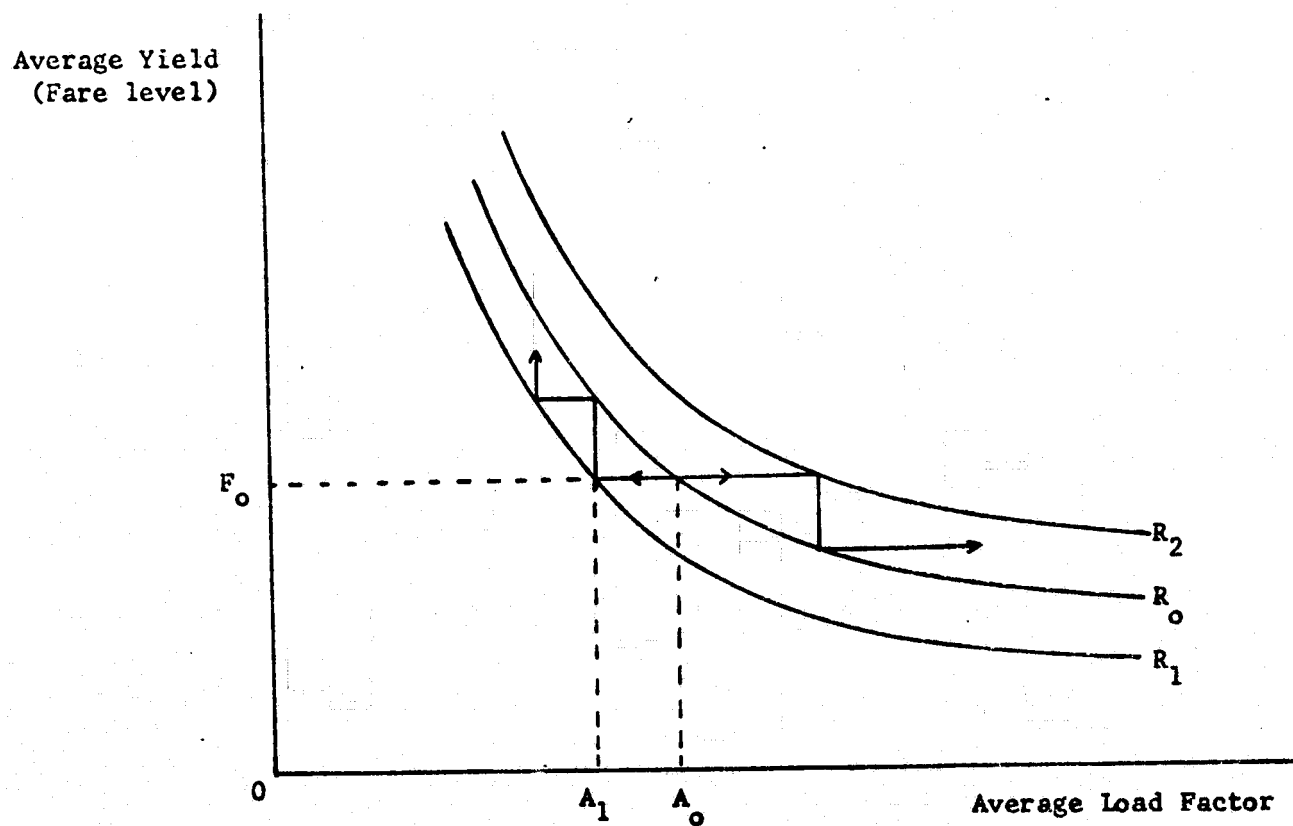


Figure 2

Source: CAB Docket 21866-7, DOT-RT-2, p. 13. Reproduced with slight modifications.

F_0 the appropriate fare level. The carriers are earning excessive profits at F_0 , so they invariably add capacity. Average load factor falls. The Board then entertains arguments that the per-passenger cost exceeds that predicted (because load factors are now lower than anticipated), and a fare increase is in order. This iterative process will continue. In sum, if the Board tries to "enforce" a rate of return either above or below the carriers' necessary rate of return, fares will either soar or plummet respectively.

The point is, you cannot regulate both load factor and rate of return by regulating fares. In fact, fares really regulate only load factor; the carriers through non-price competition, set their own rate of return. The decision reads:

"The rates of return specified herein will be used in standards for measuring the reasonableness of the general domestic passenger fare level. They are not in any sense to be regarded as guarantees that any air carrier will earn the standard return in any given year or period of years, or that the industry as a whole will achieve the specified rates in particular periods."¹ . . . The fact that earnings in a particular year are either above or below the standard rate of return would not be an occasion for fare adjustments unless the fares are significantly out of line with those required to produce reasonable earnings at the standard load factor. The Board believes that a firm adherence to this policy will enable the industry, during representative periods, to cover its cost of capital and provide investors with reasonable compensation for the risks taken and permit the carriers to attract needed additional capital." (footnotes omitted).²

¹CAB Order 71-4-58, April 9, 1972, p. 3.

²CAB Order 71-4-59, 71-4-60, April 9, 1972, pp. 73-4.

Again, I think that is a very enlightened decision.

Rate Structure Issues

So much for the fare level questions. Now let us move on to issues concerning fare structure. Briefly, economic efficiency requires that the fare in any given market be equal to the average and marginal costs of providing that service. We have a lot of evidence that this condition does not presently hold. The Board in its Phase 4, joint-fare decision found that in every single market where inter-line service is available the consumer should be offered a fare that is no higher than the sum of the "local" fares minus a \$4.00 cost saving. Although this surely is a meat-axe approach, essentially I would agree with the policy conclusion, namely that fares should reflect the level of (average and marginal) cost.

In the discount-fare phase of the Investigation, we have only the Hearing Examiner's report. It was a conservative decision; he concluded that the discount seems to be too large in some cases. He also said discounts should be available only during certain parts of the week. My position is that discounts per se are instances of (third degree) price discrimination. Whenever you have "eligibility requirements," there are economic efficiency losses. Furthermore, I would conjecture that carriers do themselves harm in many cases by having discounts.

In the fare structure phase of the Investigation, the principle issue was what form the "fare curve" should take. Since 1969, the carriers have computed the basic coach fare from a formula approximately as follows: $\text{Fare} = \text{Fixed Charge} + (\text{Charge per mile} \times \text{Distance})$. Obviously

a carrier with a preponderance of long-distance flights would not like to see the "taper" (i.e., slope of the fare-per-mile curve) increased. On the other hand, a carrier with a preponderance of short-haul flights might like to see an increase in taper.¹ Of course, the resulting fare taper arguably had to give the industry as a whole revenues sufficient to cover costs. The question boiled down to who would have an easier time of it--which carrier's proposal (if any) would be adopted. This was the great debate.

The second issue was what relationship different classes of fares would have with each other. Would first class fares be 133 percent of coach fares, 150 percent, or 110 percent? What about night coach and economy fares?

A third issue was the "zone of reasonableness" proposal that got a lot of play because of the Justice Department and DOT pushed it. What we (DOT) suggested was that in order to inject price competition into the airlines--that is, instead of deciding on a fare formula to which all carriers would in effect be required to adhere--go ahead and establish a fare formula and allow some deviation up and down. Within this "band" (DOT recommended ± 15 percent), fares would be lawful on grounds of reasonableness. Fares could still be declared unlawful on grounds of preference and prejudice. The essence of the proposal is described in Figure 3.

Some carriers, those most afraid of price competition, opposed the zone of reasonableness proposal with great vehemence. Interestingly enough, American Airlines, who is traditionally the price leader in

¹ Several of the local service carriers did not want short-haul fares raised very much, claiming that they were as "high as travellers could afford" already.

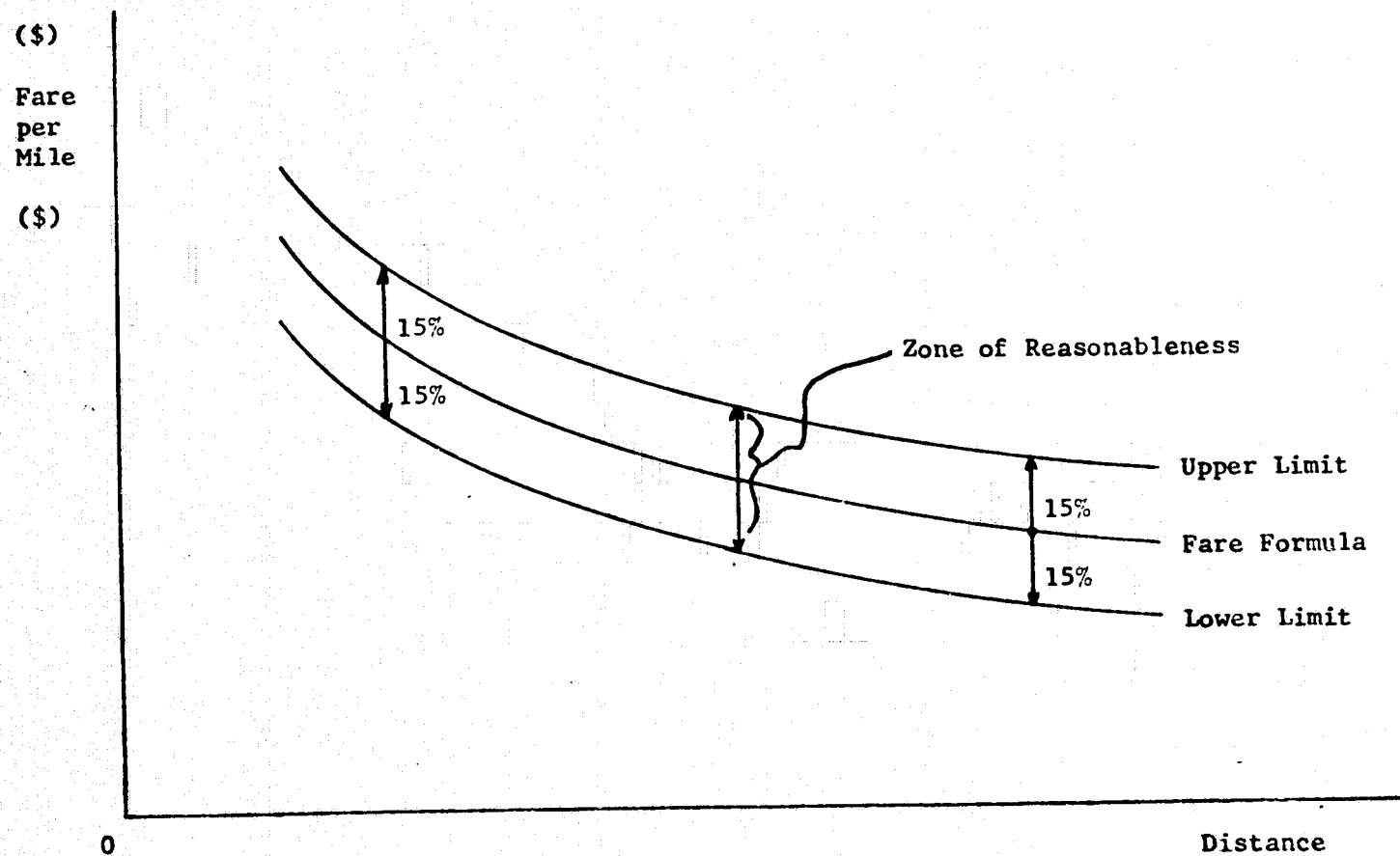


Figure 3

Source: CAB Docket 21866-9, DOT-T-4, p.5.

the industry, came in with exactly the same proposal. Most carriers were aghast at this show of initiative.

According to the Examiner's rendered opinion in phase 9, this concept, be it ± 15 percent or even ± 5 percent (as the Board's Bureau of Economics had recommended) should be squashed. The Board, however, could reverse the decision. If it does, I hope that the zone is made quite wide, since one so narrow as ± 5 percent would not make enough difference to generate much price competition.

DPFI Summary

Table 3 summarizes the results of the DPFI as of this date.

II. Entry, Exit, Merger, and Collusion

Entry of New Firm, and Choices of Carriers

Let us move now to the second type of control the Board exercises, namely determining which carriers which serve markets. Section 401(a) of the Federal Aviation Act requires that any carrier serving a market must obtain a certificate of public convenience and necessity from the Board. Has the CAB ever authorized a new full-fledged trunk carrier? The answer is, "no". The Board has never certified a new trunk carrier, although it has certified other groups of carriers. As indicated in Table 4, the trunks were certificated in 1938 when the Board came into existence. The local service carriers were given temporary authority in the 1940's and finally given permanent authority in 1955. Supplementals were certificated on an interim basis in 1962.

Table 5 compares the average size of an original trunk carrier with the average sizes of trunks and "other" carriers today. In 1938, the average

Table 3

Comparison of Policies: GPFI (1960), Policies Developed Subsequently, and DPFI (1971)

<u>Policy Issue (Phase of DPFI)</u>	<u>GPFI (1960)</u>	<u>Policies Developed Subsequently</u>	<u>DPFI (1971)</u>
1. Flight Equipment Investment	Straight-line writeoff		Affirmed
2. Leased Aircraft	-	Not included in rate base	Affirmed
3. Deferred Federal Income Taxes	Included as current expense		Affirmed
4. Joint Fares	-	a. Rate based on sum of local rates minus cost saving	a. Rated based on sum of local rates minus cost saving.
	-	b. Division based on local rates	b. Division based relative carrier costs.
5. Discount Fares	-	Discriminatory discounts encouraged	Discriminatory discounts permitted. ^{1/}
6A. Seating Configuration Standards	-	-	Standards adopted, regulation implicit.
6B. Load Factor Standards	Rejected	-	Standards adopted, regulation implicit.

Table 3: (continued)

<u>Policy Issue</u>	<u>GPFI (1960)</u>	<u>Policies Developed Subsequently</u>	<u>DPFI (1971)</u>
7. Fare Level	Unable to determine reasonable fares from record	Fares based on carrier revenue need	Fares based on average cost of providing reasonable quality of service
8. Rate of Return	<p>a. 10.5 percent overall return based on cost of capital</p> <p>b. Implication of guaranteed return</p>		<p>a. 12 percent overall return, based on cost of capital</p> <p>b. "Guarantee" explicitly rejected; actual return left to market forces</p>
9. Fare Structure	-	Gradual increase in fare taper; promulgation of industry-wide fare formula	Further increase in fare taper; rates to be cost-related, but not cost-based, using industry-wide formula; fare flexibility rejected.

1/
Hearing Examiner's initial decision.

Table 4: Certificated Carrier Groups and Dates First Authorized
by the Civil Aeronautics Board.

<u>Carrier Group</u>	<u>Date First Authorized</u>
Trunks	August 22, 1938
Local Service	November 5, 1943 (experimental); June 1, 1955 (permanent)
Supplementals	October 9, 1962 (interim); March 11, 1966 (permanent)
All-Cargo	July 29, 1949
Commuters	February 20, 1952

Source: CAB, Handbook of Airline Statistics, 1969 Edition, Part VIII.

TABLE 5

1971 Revenue Ton Miles Per Carrier Compared with 1938
Trunk Revenue Ton Miles Per Carrier, by Carrier Group.

<u>Group</u>	<u>Total Revenue Ton-Miles (X 1,000,000)</u>	<u>Number of Carriers</u>	<u>Revenue Ton-Miles Per Carrier (X 1,000,000)</u>
Trunk (1938)	55.3	16	3.5
Trunk (1971)	12,288.7	11	1,117.2
Local Service	850.5	9	94.5
Supplemental	285.5	14	20.4
All-Cargo	301.5	2	150.8
Commuter	47.1	179	.3

Sources: Table 2.2 and CAB, Handbook of Airline Statistics, 1969 Edition, p.12.

trunk carrier accounted for 3.5 million revenue ton miles. The trunks of today grossly exceed that number. The average local service carrier is 20 to 30 times as large as the trunk carrier of 1938. Even an average commuter airline today carries almost one-tenth of an original trunk's traffic.

The point I wish to emphasize is that the effect of CAB regulation of entry of new firms has been to protect the original trunks. The Board has never certificated direct competition on an equal footing with trunk carriers. It introduced local service carriers as feeders to trunk carrier terminals. That helped the trunks because it got them more traffic than they would have had otherwise. But note that it took a public law in 1955 to get the local service carriers permanent certificates. The big fight over the supplementals was the same way. The trunks were afraid of encroachment into their markets. It took a public law to get the supplementals certificated.

For the commuter airlines, "Part 298" was set up in 1952. Part 298 said that if you wanted to run an airline with aircraft that weighted less than 12,500 lbs. gross take-off weight, that would be OK with the Board. Of course, everyone knew that service with such a vehicle just could not be viable. Technology, however, has changed all that, and today there are many carriers providing very good service with light-weight equipment. Recently, the local service carriers proposed that the Board start regulating the commuter carriers because they were giving the locals too much competition. The fact that commuter carriers exist in many local service markets and even compete in some trunk carrier markets--despite immense handicaps--should suggest something about the effects of (de)regulation

or the efficiency of air carrier operations.

Entry into City-Pair Markets

What about entry into city pair markets? One thing to note immediately is that the percentage of "monopoly markets" had been decreasing over time. As late as 1955 almost half the trunk carriers' traffic was in non-competitive markets. As shown in Table 6, today less than a quarter is in monopoly markets.

Entry has taken place in a number of ways. The difficulty is that there is no good aggregated measure of this entry. Table 7 shows that route miles operated by the trunk carriers has increased over time, especially between 1966 and 1968. Another measure is the number of points served. As shown in Table 8, this also has been increasing over time.

Whenever entry into a city-pair market is proposed, the Board traditionally looks to several criteria in interpreting its statutory mandate. First, the Board must decide whether a carrier is fit, willing and able to serve. More importantly, the Board must also determine that there is a need, in the public interest, for the service. An incumbent carrier is going to object to having additional competition. What you inevitably get into are proceedings where the incumbent carrier says, "no, we are providing great service," and the petitioning carrier says, "no, they are not providing good service, we are going to provide better service." It usually comes down to who has the best argument. And weights of legal arguments do not necessarily coincide with economic forces.

Another consideration is that procedure discourages entry. Why bother to get into a new market if you have to go through a morass of expensive litigation? This obviously is a constraint.

TABLE 6

Percentage Share of Carrier and Group Revenue Passenger Miles in
Competitive Markets, Selected Years, 1955-1970.^{a/}

Carrier/Group	<u>1955</u>	<u>1960</u>	<u>1970</u>
American	58.6	77.2	83.0
Eastern	46.3	73.7	76.6
TWA	62.9	78.8	91.1
United	61.3	71.0	67.5
Big Four	<u>b/</u>	<u>b/</u>	79.8
Braniff	32.4	50.2	66.0
Continental	12.5	65.2	79.4
Delta	37.9	58.9	67.9
National	80.2	88.0	89.1
Northeast	8.7	79.9	88.9
Northwest	59.3	73.9	63.5
Western	54.4	53.4	73.4
Other Trunks	<u>b/</u>	<u>b/</u>	73.7
All Trunks	55.6 ^{c/}	72.2 ^{c/}	76.5

^{a/} A market is considered competitive if no one carrier has over 90 percent of the traffic in that market.

^{b/} Not available.

^{c/} Weighted average; includes data for Capital (which merged with United in 1961), not shown in table (49.2 in 1955, and 70.5 in 1960).

Sources: 1955 and 1960--Richard J. Barber, "Airline Mergers, Monopoly, and the CAB," Journal of Air Law and Commerce, Vol. 28 (1961-1962), p. 213; 1970--CAB Docket 23852 ("Northwest-National Merger Case"), BOR--16&17.

TABLE 7

Weighted Average Route Miles Operated, by Carrier, Domestic Operations,
1938, 1960, and 1965-1970 (in thousands of miles).

<u>Carrier</u>	<u>1938</u>	<u>1960</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>
American	6.8	7.0	6.7	6.7	6.7	6.7	6.3	8.5
Eastern	5.3	7.6	7.6	7.5	9.3	10.1	10.4	11.4
TWA	5.7	7.1	6.9	6.6	6.5	6.5	7.6	9.1
United	5.3	6.4	9.8 ^{a/}	9.7	9.9	10.1	10.1	12.6
Braniff	2.5	5.3	5.4	5.4	6.4	7.0	9.0	12.5
Continental	0.6	4.5	3.7	3.7	4.7	5.7	6.6	8.8
Delta	1.1	5.7	8.5	8.5	8.5	8.5	8.8	10.0
National	0.9	2.9	5.8	5.8	5.8	5.8	6.3	5.4
Northeast	0.6	2.5	2.2	2.2	2.2	3.0	5.1	7.2
Northwest	2.5	4.8	5.1	5.2	4.6	4.5	4.6	7.1
Western	1.2	4.6	4.5	4.5	4.6	4.7	5.5	9.7
Big Four	b/	28.2	31.0	30.5	32.4	33.5	34.4	41.6
Other Trunks	b/	35.1	35.2	35.3	36.9	39.2	45.9	69.9
All Trunks	b/	63.6	66.2	65.8	69.2	72.7	80.4	111.5

^{a/}Capital merged with United on June 1, 1961. At that time, Capital operated 4,300 route miles.

^{b/} Not available.

Sources: United States Civil Aeronautics Board, Handbook of Airline Statistics, 1969 Edition, p. 384; and ibid, 1971 Edition, p. 404; and U.S. Civil Aeronautics Board Reports to Congress, Fiscal Year 1970, p. 126.

TABLE 8

Number of Points Served, by Carrier, Domestic Operations, 1938, 1960, and 1965-1970.

<u>Carrier</u>	<u>1938</u>	<u>1960</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>
American	59	71	55	54	54	55	55	58
Eastern	42	104	95	83	85	85	85	83
TWA	27	59	49	43	43	41	41	45
United	38	63	89	89	89	90	90	92
Braniff	21	54	39	36	36	36	32	37
Continental	8	37	21	21	24	24	24	28
Delta	13	63	60	60	59	59	59	62
National	13	37	36	36	36	36	36	36
Northeast	16	45	41	41	36	36	39	40
Northwest	21	34	31	30	30	31	31	34
Western	12	37	28	28	28	34	34	34

Sources: Civil Aeronautics Board Reports to Congress, Fiscal Year 1970, p. 126; 1969, p. 93; 1968, p. 54; 1967, p. 41; 1966, p. 82; 1965, p. 92; 1964, p. 84; 1963, p. 75; 1962, p. 66; 1961, p. 67; and 1960, p. 61.

On the other hand, the Board, rather than constraining entry, will sometimes "force" carriers into markets. In their sub-part M proceedings, the Board put the local service carriers on notice that it would attempt to reduce subsidy requirements by giving the locals longer-haul, higher-density markets in competition with trunk carriers. From these markets the locals would earn profits which would then be used to offset losses in less-dense, shorter-haul markets. But given that locals often have an equipment disadvantage, how can they be expected to make profits in markets which the trunks themselves have trouble covering costs? As could have been predicted, this effort has failed.

Bill Fruhan has talked about another type of "forced entry."¹ He depicted the entry game as a prisoner's dilemma. A carrier gets into a route prematurely because, though he knows he will lose money if he gets in, he will lose more money if he fails to take advantage of the opportunity. Of course, if there were no controls on future entry, carriers would move into a market only as it became economic to do so.

Exit from Service

The next question of CAB control over carrier economic activity concerns market exit. No trunk carrier has ever gone bankrupt. "Failing firms" have always been absorbed through merger.

On the city-pair market level, exit has been fairly easy, at least for the trunk carriers. The local service carriers have found it at times hard and at times easy to abandon markets depending on their subsidy needs and the Board's willingness to grant subsidy. Right now, many local service carriers are turning over their least dense markets to commuter

¹William E. Fruhan, Jr., The Fight for Competitive Advantage: A Study of the United States Domestic Trunk Air Carriers (Boston: Graduate School of Business, Harvard University, 1972).

carriers under contractual arrangement.

Mergers

What about mergers? Table 9 summarizes the mergers that have taken place among trunk carriers. Briefly, in historical review, the Board has vacillated in its attitude toward mergers. During the period from 1938 to the late 1940's, the Board was fairly pro-competitive, turning down a host of merger proposals. From the late 1940's to about 1956, it actively encouraged mergers. From 1956 until very recently, the Board has been pro-competitive again. Recently, it has become rather permissive. It approved the Northwest-Northeast proposal (which fell through), Allegheny-Mohawk (which has been consummated), and Delta-Northeast. Still pending are American-Western and Northwest-National.

The work I have done and the work of many other economists has concluded that the airline industry is characterized by reasonably constant returns to scale. Size per se does not seem to have a significant influence on average cost. That being the case, mergers are not likely to have a significant effect on average cost. If there are no such cost savings, then why do companies merge? First, one carrier might simply buy up the physical assets of another company which is going out of business at a good price. But usually the most important thing the surviving carrier acquires from the failing firm is that carrier's routes. The price paid to most carriers going out of business is not for the equipment, but for the routes.

When one carrier buys out another for the purpose of expanding routes, the merger is usually fairly innocuous. The type of merger that you have

TABLE 9
Successful and Unsuccessful Mergers Involving Trunk Carriers, 1938-1972

<u>Year</u>	<u>Number of Trunk Carriers</u>	<u>Comments</u>
1938	16	
1939	16	
1940	16	United*-Western merger denied
1941	16	TWA* absorbed Marquette
1942	16	
1943	16	
1944	16	Western* absorbed Inland
1945	16	Northeast* absorbed Mayflower; American* absorbed American Export
1946	16	Braniff*-Frontier merger denied; American*- MidContinent* merger denied
1947	16	Capital*-Northeast* merger denied
1948	16	
1949	16	
1950	16	Mid Continent-Parks merger denied
1951	16	Continental*-Midwest merger withdrawn
1952	16	Northwest*-Capital* merger dismissed; Braniff* absorbed Mid-Continent*
1953	14	Delta* absorbed Chicago and Southern*
1954	13	Eastern*-Colonial*-National* merger denied
1955	13	Continental* absorbed Pioneer; Delta*-Northeast* merger withdrawn
1956	13	Eastern* absorbed Colonial*
1957	12	
1958	12	
1959	12	
1960	12	
1961	12	United* absorbed Capital*
1962	11	Continental*-National* merger withdrawn
1963	11	Pan-Am-TWA* merger withdrawn; American*- Eastern* merger disapproved
1964	11	
1965	11	
1966	11	Braniff* absorbed Panagra
1967	11	Eastern* absorbed Mackey; Braniff absorbed Pan American-Grace; Western* absorbed Pacific Northern
1968	11	
1969	11	
1970	11	American* absorbed TCA; Northeast*-Northwest* merger approved, subsequently terminated by Northwest
1971	11	
1972	11	Delta* absorbed Northeast* American*-Western* merger denied

* Indicates trunk carrier.

Sources: U.S. Civil Aeronautics Board, Handbook of Airline Statistics, 1969 Edition, pp. 457-471 and 503.

to look out for is one which results in increasing monopoly power. For example, a study done by the CAB's Bureau of Operating Rights noted in the United-Capital merger that in markets where competition was eliminated, service deteriorated.

Collusion

What about collusion? The Board must approve any formal agreements among carriers. It has approved the capacity restriction scheme in the transcontinental markets. It has approved congestion agreements.¹ The Board has approved mutual aid pacts and an agreement limiting competition on travel agents' commissions. All these things are very anti-competitive, and open to a lot of criticism.

There is also the specter of extra-legal collusion. There is no hard evidence of this, however. What usually happens is that there is a down-turn in the industry's financial prospects. The carriers start blaming the Board for being a spoil-sport, and they go around making speeches and handing out press releases. Finally, one carrier, usually American, petitions for a fare increase and most of the other carriers join in. That gives the appearance of collusion, but you cannot prove it. Chris Barnekov did some studies which found that in some markets tacit collusion on service appears to work and in some markets it does not. But this too is difficult to prove.

¹Economists have looked upon congestion agreements as a poor second best. A better method would be to allocate airway and landing space according to passengers' values as reflected in the prices they would be willing to pay.

III. Regulation vs. Deregulation

What are the costs of regulation? References to the California intra-state markets suggest that without regulation fares would drop about 20 percent. I am dubious of simply ascribing a "20 percent efficiency loss" due to regulation from this experience since the quality of service in these markets, measured by average load factor, is commensurately lower. Without regulation, technical efficiency probably would increase no more than 5-10 percent. One might note also that the Board could reduce fares 20 percent simply by setting higher load factor standards. My feeling is that the greater costs of regulation arise from not having the optimal quality of service. You have too high a price and too high a quality of service. Consumers in the aggregate would prefer a lower quality of service and a lower price.

On a disaggregated basis there are social welfare losses arising from allocative inefficiencies. Because prices do not equal costs in some markets, there are modal split problems. Carriers say they cannot raise prices very high in short-haul markets because passengers will desert to their automobiles. That is exactly what they should do. The fact that they don't because prices are kept artificially low indicates a misallocation of resources.

You may also find "wrong" carriers in "wrong" markets. I once compared the carriers' actual costs per ton mile with those estimated from a regression equation. The results are summarized in Table 10. These numbers are in the form of "(in)efficiency indices," where the lower the number, the more efficient the carrier. For example, American, in 1970,

TABLE 1G

Actual Unit Cost as Percent of Estimated Unit Cost, for the Years
1962-1970, U.S. Trunk Carriers; Also, Percent of Revenue Passenger
Miles in Competitive Markets, 1970.

Carrier	1962	1963	1964	1965	1966
American	115	113	112	113	102
Eastern	93	92	96	103	113
TWA	115	111	113	112	114
United	103	106	101	101	107
Braniff	93	96	99	107	106
Continental	84	88	90	75	70
Delta	105	105	102	100	100
National	88	89	89	86	86
Northeast	115	127	118	119	116
Northwest	97	86	86	80	81
Western	95	89	96	101	102

	1967	1968	1969	1970	Percent in Competitive Markets
American	99	100	98	95	83.0
Eastern	107	113	108	104	76.6
TWA	113	111	112	109	91.1
United	103	103	99	97	67.5
Braniff	109	113	112	106	66.0
Continental	76	87	89	90	79.4
Delta	101	100	92	84	67.9
National	91	88	89	99	89.1
Northeast	120	100	119	116	88.9
Northwest	77	78	77	94	63.5
Western	0	108	108	113	73.4

had actual cost per available ton mile equal to 95 percent of the "estimated" amount. The equation from which Table 10 is derived is shown as regression #1 in Table 11. I emphasize most strongly, however, that these comparative results are preliminary and are subject to considerable error.

In closing, let me just mention briefly deregulation. Under a completely deregulated regime, retaining only the safety restraints of the Federal Aviation Administration, the industry would have a great deal more price competition. Exit and entry into particular markets would be governed by conditions of cost and demand. There would be much more service differentiation, some carriers offering high-density, low-quality and low-cost service; other carriers offering low-density, high-quality and high-cost service.

What about the structure of the industry? For one thing, there likely would be a greater number of carriers in the market, since there are no detectable scale economies above small-sized firms. There probably would be more oligopolistic practices (price as well as service quality), which is a problem. But as long as entry were free, this would be policed pretty well.

To be candid, the prospects for total deregulation are close to nil. (Those who would benefit from deregulation fail to perceive the opportunity and in any event are poorly organized and not very powerful; those who would be hurt by deregulation know well the situation, are highly organized and very influential.) What part-way measures are worth considering? First, adoption of the zone of reasonableness proposal would bring about some price competition and a gradual elimination of price discrimination.

TABLE 11

Average Cost Regression Equations for Domestic Trunk Carriers

Regression number	Dependent variable	Inter- cept	Independent variables (with T-ratios)					
			1963	1964	1965	1966	1967	1968
1	TOE/ATM	84.6	-1.28 (-1.04)	-2.74 (-2.21)	-3.42 (-2.71)	-3.11 (-2.43)	-3.86 (-2.85)	-4.52 (-3.36)
2	DOE/ATM	42.8	-.76 (-1.66)	-1.8 (-3.87)	-2.42 (-5.13)	-2.51 (-5.23)	-2.7 (-5.31)	-3.11 (-6.17)
3	IOE/ATM	41.81	-.52 (-.58)	-.94 (-1.05)	-1.1 (-1.1)	-.6 (-.65)	-1.16 (-1.19)	-1.41 (-1.45)

	Independent variables (with T-ratios)					Cor- rected R-square	F-Sta- tistic	St. Err. of estimate
	1969	1970	log ATM	log LEN	log DEN			
1	-3.76 (-2.79)	-.97 (-.7)	-.36 (-.39)	-12.16 (-6.67)	3.18 (2.12)	.46	8.5	2.8
2	-2.62 (-5.19)	-1.26 (-2.43)	-.51 (-1.5)	-5.94 (-8.69)	1.82 (3.24)	.69	21.	1.08
3	-1.15 (-1.18)	.28 (.28)	.16 (.24)	-6.22 (-4.71)	1.35 (1.25)	.19	3.1	2.08

Degrees freedom

86

86

86

Second, why not make the certificate of public convenience and necessity contingent merely on being consistent with the public interest, rather than being required by it? This would force the Board to make a finding that entry would be adverse to the public interest in order for such entry to be denied. Also, such a provision, properly drawn, would constrain the Board from denying entry on grounds that it would impair an incumbent carrier. Third, redefine the "public interest" in Section 1002 of the FA Act to mean the attainment of economic efficiency. At present the language is so broad that almost any decision and policy direction can be "justified." Finally, facilitate exit through a contractual scheme such as proposed by George Eads,¹ similar to one presently being advanced by the Board itself.

This obviously is only a partial list of alternative courses of action. Some such reforms would require Congressional action; some could be put into effect by the Board under the existing statute (e.g., the zone of reasonableness). Fortunately for the airlines, they have been in a rapidly growing industry, where the mistakes of regulation are soon forgotten, and where inefficiency costs to the public are not so obvious. Although industry and government officials often speak of "crises" in commercial aviation, the truth is that nothing on the horizon is likely to jolt the public and its Congressional representatives to question seriously the regulatory institution. In such a circumstance it will take gutsy policy-makers and articulate advocates to bring about desirable change.

¹George Eads, The Local Service Airline Experiment (Washington: The Brookings Institution, 1972).

N73-32862

SURVIVAL, PROFITS, & RESOURCE UTILIZATION

Prof. William Jordan*
York University
Ontario, Canada

July 14, 1972

Abstract

The performance of an industry is greatly influenced by the institutional environment within which it operates. In the case of the certificated interstate airlines, the regulatory environment shaped by the Civil Aeronautics Board's procedures, policies, and decisions has had an important effect on airline costs. Unfortunately, the intertwining of CAB regulation and airline operations makes it impossible to use operating and financial data from the regulated airlines to determine the extent to which regulation affects costs. It happens, however, that the essentially nonregulated, but otherwise, similar, intrastate airlines operating wholly within California (and thus beyond the CAB's jurisdiction) provide a benchmark with which to compare the performance of regulated airlines and thus measure the effects of CAB regulation. This comparison, which serves as the basis for the lecture, shows that the nonregulated environment within California has been a much sterner disciplinarian of airline operations than the regulated environment of interstate air transportation. Issues of survival, profits, efficiency, fares, and the impacts of CAB regulation on costs are examined.

* This paper was reconstructed by the Editor with the permission of Professor Jordan and his publisher, The Johns Hopkins Press, from the tape recording of Professor Jordan's talk, this outline notes and his book, Airline Regulation in America, Effects and Imperfections, 1970. Specific references and sources of data are in Professor Jordan's book, but have been deleted from this paper in the interest of space. All tables labled 10- or 11- have been taken directly from the book. Other tables have been numbered sequentially.

Because of time considerations, Professor Jordan has not been able to review this reconstruction, and therefore any erros, mistatements or the like are the Editor's and not his.

The growth of the CAB-regulated airlines has been, and continues to be, outstanding. But even though this expansion occurred while the certificated carriers operated under CAB regulation, it does not necessarily follow that the CAB had any measurable impact on the development of these airlines. Many other industries, regulated and non-regulated, enjoyed substantial growth during this same period. It is possible that the airline industry could have expanded even more rapidly without CAB regulation.

It is possible to study the extent of CAB influence on the certificated carriers by comparing their development with that of similar airlines not regulated by the CAB. Starting in 1946, a number of airlines quite similar to the CAB-regulated interstate airlines operated substantial scheduled service wholly within the state of California and thus beyond CAB jurisdiction. A comparison of their development with that of the certificated carriers provides a basis for measuring the economic effects of CAB regulation.

The Scope of Regulation

Since the beginning of the CAB in 1938, it has had regulatory power over the certificated carriers in the areas of entry, exit, service, and price. The California intrastate carriers have also been subject to some direct economic regulation, though not by the CAB. Since the airlines first began operations, certain

Provisions of Article XII of the California State Constitution (pertaining to transportation in general) had been given. Before September 17, 1965, the California Public Utilities Commission (PUC) had jurisdiction over only the prices charged for scheduled air service within the state. However, on that date the California legislature gave the PUC authority over the entry, exit, and service of the intrastate carriers, in addition to its existing power over prices. Because of this increase in the regulation of intrastate carriers, this study is confined to the period from 1946, when the first intrastate carrier inaugurated service, to 1965. Table 1 compares the economic regulatory powers of the CAB and the PUC for this 20-year period.

TABLE I
Differences in Economic Regulatory Powers

Area of Direct Regulation	CAB	PUC (to 9/17/65)
Entry and Exit	Complete	None
Service	Limited, but could exert great indirect pressures	None
Price	Complete	Complete, but by policy decision, only regulated increases

1

Because regulatory commissions have considerable discretion, the degree of actual regulation may be less than the maximum allowed and may change over time. For example, even though it had the power to regulate both price increases and decreases, in practice the PUC only controlled increases where CAB controlled decreases as well. Overall, a detailed examination of the actual practices of the CAB and the PUC has shown that the California intrastate carriers operated under relatively limited regulation by the PUC, whereas the certificated carriers were extensively regulated by the CAB. Thus, if these two groups of carriers operated under fairly comparable technological, economic, and operational conditions, major differences in performance between them can be attributed to the differences in economic regulation.

Similarities Between the Carrier Groups

In 1965 the California intrastate carriers accounted for 1.1 percent of total common-carrier, scheduled revenue passenger-miles flown in large aircraft (ranging from DC-3's to four-engine jets) within the contiguous 48 states, and 2.2 percent of the total scheduled domestic passenger originations. The three largest California markets were extremely important markets in the overall domestic airline route structure, ranking first,

ninth, and twenty-third in passenger volume among all domestic U.S. city-pair markets. The ability of certain intrastate carriers to survive and even dominate such markets makes it clear that, within their limited geographic area, they were large-scale operators and that their service during the period studied was significant.

Technological conditions were essentially the same for all U.S. airlines from 1946 through 1965. Airports, air traffic control, and airways have generally been provided by federal or local governments and have been used jointly by all types of carriers. Suitable personnel, maintenance facilities, communications, marketing services, etc., have been widely available within the United States to any who care to utilize them at existing prices. Most important, substantial numbers of large commercial aircraft were available from aircraft manufacturers (located mainly in Southern California), and many commercial aircraft could be bought second-hand from the federal government, airlines, and other owners throughout the postwar years. During a substantial part of the period studied, identical aircraft types were operated by both the certificated and the intrastate carriers.

Differences did exist between the general economic and demographic conditions in California and in other parts of the

country. Above average increases in population and economic development have occurred in California since World War II. The differences in these growth rates, however, do not appear to be large enough to affect significantly a comparison of California intrastate airlines with the certificated airlines. Indeed, the large growth rate of air transportation in all parts of the country probably is sufficient to "swamp" any effect of differences in economic growth.

The greatest differences between these carrier groups are to be found in operational factors - for example, in distance. The fact is that the cities comprising the longest nonstop market within California (San Diego and San Francisco) are only 449 statute miles apart. In contrast, the domestic nonstop markets of the certificated carriers range up to 2,700 miles. Nevertheless, the average distances for the certificated trunk carriers' on-line passenger trips and flight stage lengths differed much less from those of the California intrastate carriers than the distance differences existing between their longest nonstop markets. Furthermore, the local service carriers' average on-line passenger trip and stage length distances were less than those of the intrastate carriers; therefore, by comparing the intrastate carriers with both classes of certificated carriers, differences due to distance may be partially accounted for.

Although the certificated and California intrastate carriers did not operate under identical conditions, the similarities were substantial and the carrier groups were sufficiently comparable to permit the conclusion that differences between them were due to differences in regulation. This is especially true when the relationship between carrier performance and regulation proves to be quite direct and when differences between carrier groups are very large - so large, in fact, that they really cannot be explained away simply by pointing to certain differences in technological, economic, or operational conditions.

The following sections compare the CAB-regulated airlines with the California intrastate carriers. In particular, three questions will be examined in detail:

1. Is regulation necessary for reliable service or will "cut throat" competition drive fares down below survival levels?
2. If carriers do survive, what is their profit experience?
3. What factors affect the cost structure allowing survival with low fares?

SURVIVAL

Certificated Carrier Entry and Exit

A total of 16 certificated trunk carriers operated during all or part of the period from 1946 through 1965. During this period,

five of the carriers were acquired by or merged with another trunk carrier, so that by June 1, 1961, only 11 trunk carriers remained in operation. All of the 16 trunk carriers received their certificates of public convenience and necessity from the CAB in 1939 and no other airline has since received such a certificate authorizing it to provide comparable trunk-type service. Apparently the necessary and sufficient condition for an airline to have obtained a certificate for the performance of interstate trunk carrier operations was for it to have been in operation between May 14 and August 22, 1938 - the "grandfather" period specified in the 1938 Act.

In contrast to the trunk carriers, the local service carriers were initially certificated by the CAB without benefit of a "grandfather" clause. Beginning with Pioneer Air Lines (then named Essair, Inc.) on November 5, 1943, and ending with Ozark Air Lines on September 26, 1950, the CAB authorized 21 carriers to provide subsidized, experimental, "local feeder" service connecting smaller communities with larger cities, which, in turn, were generally connected by the trunk carriers. Except for a few isolated instances, the local service carriers were not permitted to provide nonstop, terminal-to-terminal service or to operate in direct competition with the trunk carriers during the period covered by this study.

1

Of the 21 local service carriers receiving certificates from the Board, 13 were still in existence at the end of 1965. Of the 8 that ceased operations, 4 terminated service when the CAB canceled their certificates or denied their requests to extend or renew temporary certificates, and 4 merged with another certificated carrier. These terminations and mergers all occurred before the enactment of Public Law 38 on May 19, 1955, which required the CAB to issue permanent certificates to the surviving local service carriers. There was no further exit from the ranks of the local service carriers throughout the remainder of the period covered by this study.

Overall, it is clear that entry into the ranks of the certificated carriers has been limited to a single time period for each class of carriers, and so long as a departing carrier possessed a CAB operating certificate, exit had been via merger with or acquisition by some other certificated carrier.

Intrastate Carrier Entry and Exit

Between 1946 and 1965, a total of 16 California intrastate carriers provided scheduled, common-carrier service with DC-3's or larger aircraft. Two important facts emerge from comparing the intrastate carriers with the certificated carriers. First, even though the California intrastate market was much smaller than the national market available to the certificated carriers,

the number of intrastate carriers equals the number of trunk carriers in existence during these years and is not much smaller than the number of local service carriers certificated by the CAB. Second, rather than entering during a single period, the intrastate carriers entered at various times from 1946 through 1964, with most entry occurring during 1949 and early 1950, and between May 1962 and September 1964.

The Evidence of Survival

Eight of the 16 carriers that operated large aircraft within California between 1946 and 1965 did so for only one to six months because of their short periods of service they are not considered viable attempts to become established in the California markets. The remaining eight carriers (the so-called major carriers) survived for nine months or more. One of these, PSA, has managed to survive since May 1949, even though, with the exception of a few years in the early 1960's, it charged the lowest fares per mile available within California. Its performance alone shows that low fares were not a sufficient condition for failure in these markets, a conclusion buttressed by the successful operation of Mercer Enterprises since early 1964.

Of the six major intrastate carriers that terminated service at least two of them clearly did so for noneconomic reasons.

Paradise Airlines terminated operations because the Federal Aviation Agency suspended its commercial operator certificate following the crash of its Constellation on March 1, 1964. The transcript of the Civil Aeronautics Board hearing in which Paradise unsuccessfully appealed the FAA's action shows that the owner of Paradise was eager to resume operations. He was convinced that Paradise's service under its existing fares was viable and was prepared to test that conviction.

Similarly, Western Air Lines of California (WALC) also discontinued service for noneconomic reasons. Western Air Lines (the trunk carrier) finally obtained permission from the CAB to introduce day-coach service at fare equal to those offered by WALC and the other intrastate carriers. Given this permission, Western canceled its extensive leasing arrangements with WALC (thereby causing WALC's demise) and introduced an identical service under its own name.

While Western believed low-fare service was viable, it did not believe such service maximized the profits available from this market. Clearly, the certificated carriers would have preferred the continuance of the situation existing prior to 1949 when they alone offered service under first-class fares that were more than twice the initial coach fares of the intrastate carriers. Given, however, the introduction of low-fare service by the

intrastate carriers and the resulting "diversion" of traffic from first-class to coach service, Western and United chose to match these low fares and service rather than limit themselves to carrying only first-class passengers. They would not have done so had such low-fare service been unprofitable, nor would WALC have been sustained by Western had its service incurred significant losses.

Two of the eight major intrastate carriers terminated service through bankruptcy proceedings. Bankruptcy may be a clear indication of uneconomic operations, but it does not tell whether fares were too low or costs too high. Indeed, one of these two carriers, Pacific Air Lines, adopted the certificated carriers' relatively high, first-class fares for its service. For the Burbank-San Francisco market, Pacific's fare in 1946-47 was more than 50 percent higher than the coach fare introduced in 1949 (\$15.15 vs. \$9.95). Thus, for whatever reasons Pacific went bankrupt, it did not do so because it charged low fares.

California Central Airlines (CCA) was the second of the major carriers to go bankrupt. Of course, it did charge low fares so that they could have been a factor in its service termination. Four factors, however, seem to be relevant in evaluating this possibility. In the first place, during 1952 CCA led the other carriers in increasing the Los Angeles/Burbank-

San Francisco/Oakland fare from \$11.70 to \$13.50 (together with the \$1.80 increase in the associated San Diego-San Francisco/Oakland fare), and this action was followed by a sharp reduction in its 1953 and 1954 traffic. Second, the analysis of CCA's financial statements shows that its costs increased substantially during 1953 even though its traffic volume decreased. Third, the owners of CCA reinstituted service with California Coastal Airlines shortly after CCA's assets had been sold in bankruptcy, and they did so at fares equal to or lower than those in effect prior to the bankruptcy proceedings. This does not indicate that they thought low fares were the crucial factor in CCA's bankruptcy. Finally, it should be remembered that CCA managed to survive for over six years prior to its bankruptcy. Thus, at the very least, its low fares did appear to cover average costs for a significant part of this period.

The evidence from the remaining two major carriers is not as clear. California Coastal Airlines operated for over two years, during which time it lowered rather than increased its fares. Thus, it appears that higher fares were not considered viable by its management. The fact remains, however, that California Coastal did gradually reduce its service and eventually transferred its equipment to the nonscheduled operations of its associated company, Airline Transport Carriers, indicating that

more profitable opportunities existed in the services provided by that latter company.

Trans California Airlines (TCA) did not lower its fares during the more than two years it operated from 1962 to 1964. On the other hand, neither did it increase its fares, even though it could easily have done so. The former president of TCA attributed its failure not to its low fares but to the loss of traffic that resulted when Western inaugurated Thriftair service between Los Angeles and Oakland in June 1964.

In summary, two of the eight major intrastate carriers did manage to survive while charging low fares, whereas, of the six carriers that terminated service, two clearly did so because of noneconomic factors. Thus, at most, the attrition due to economic considerations was no more than 50 percent. Of the four carriers whose service terminations appear to have been due to economic factors, one charged high first-class fares, so that low fares cannot be blamed for its failure. The actions of the other three major carriers indicate that at least their managements thought low fares were not the critical factor in their failure to survive. In their cases it appears that either rival service by other carriers prevented their achieving viable levels of output or that their modes of operation were such that average costs exceeded those attainable under alternative operating procedures.

In the evaluation of the viability of economic activities in an open market, it is the fact of survival that is crucially important. Other measures of performance are secondary. This section has shown that some of the intrastate carriers did survive, and this provides hard evidence about the economic viability of low-fare service wherever conditions exist similar to those existing within California during the period studied.

PROFITS

The Evidence from Financial Statements

The earliest available financial information regarding the intrastate carriers is that presented by the PUC's staff in the 1949-50 investigation of the "reasonableness" of the intrastate carrier's low fares. The conclusion of this study was that the operations of the intrastate carriers as a group during the first ten months of 1949 were profitable, and that CCA and WALC earned rates of return after taxes in excess of 10 percent.

Abbreviated income statements are available for California Central for almost all of its six years of operations. Starting with February 1, 1949 (one month after it inaugurated service), and extending through December 31, 1953, CCA's operating revenues totaled \$7,172,000, and operating expenses (including depreciation) totaled \$7,292,000. This resulted in an overall operating loss of \$120,000 and an operating ratio (total operating expenses divided by total operating revenues) of 101.7 percent - hardly an

outstanding performance, and one that appears to forecast the approaching bankruptcy of CCA. An inspection of the data for the various time periods, however, shows that CCA had operating profits for the two months ended March 31, 1949, and for the years ended March 31, 1951 and 1952. Indeed, the really major loss (of \$126,000) occurred during the nine months ended December 31, 1953, a period in which CCA experienced a 37-day strike of its manintencance employees that curbed operations during July 1953 (a peak traffic month). The fiscal year in which CCA had its greatest profit ended on March 31, 1951. This was the last full year of DC-3 operation, and for eleven of the twelve months, the low \$9.99 fare was in effect between Los Angeles and San Francisco. CCA's profit performance with the Martin 202 (introduced on August 31, 1951) and with the \$11.70 and \$13.50 Los Angeles-San Francisco fares was poorer than under its earlier combination of aircraft and fares.

The income statement for the period from January 28 to December 31, 1954, covers the first eleven months that CCA operated under the general direction of the court-appointed bankruptcy referee, although its owners actually controlled operations as debtors in possession. It shows that the large rate of loss experienced during the last nine months of 1953

had been reduced and an operating loss of only \$25,000 was incurred during these eleven months. The operating ratio was 101.4 percent, or just under the average for the previous five years. Net nonoperating expenses increased the loss for this period to about \$39,000, but noncash depreciation charges of \$110,000 resulted in a positive operating cash flow. This indicates that CCA was on the road to regaining a viable operation, but apparently it was too late to overcome the losses of 1953.

It is beyond the scope of this study to delve more deeply into the reasons for CCA's bankruptcy. The effects of the strike were certainly harmful; the one-year lease of an L-049 aircraft from July 1952 through June 1953 (at a fee of \$330,000) proved to be extremely detrimental to both Airline Transport Carriers and CCA; the unilateral fare increase of June 15, 1952, resulted in a sharp reduction in traffic, etc. The important point for this study, however, is that through 1952, CCA's operations were marginally profitable under the relatively low fares then in effect.

Western Air Lines of California's income statement for the period from August 19, 1949, through January 31, 1950, shows a loss of \$22,800 after taxes on total revenues of \$596,500. The monthly breakdown for this 5½ month period shows, however, that most of this loss was incurred in January 1950. Only small

losses were experienced in August and November 1949, with profits being earned in the other months. During this period, WALC paid Western Air Lines a total of \$556,466 in charter fees. This should be compared with Western's estimate of \$570,628 for direct aircraft operating expenses, including depreciation, for a similar, if not identical, schedule pattern covering the entire year ending June 30, 1951. This implies that any profits made by WALC's operation were captured by Western through its leasing fees. Of course, this is consistent with the effective control exercised by Western over WALC throughout its lifetime.

From April 6 to December 31, 1962, Paradise Airlines made a small operating profit, but nonoperating expenses resulted in a loss of \$332. The record for all of 1963, indicates operating losses of over \$25,000 and total losses of \$37,000. But total revenues in 1963 were \$616,000 compared with just over \$150,000 for the eight to nine months of service in 1962. This large increase in revenues combined with the extraordinary operating expenses, due to the introduction of L-049 service in April 1963, may have been the reason why the owner of Paradise was so eager to continue service after the fatal accident on March 1, 1964.

The very limited data for Trans California indicate that it enjoyed a net profit before taxes of \$22,000 during the eleven months ended March 31, 1964. This figure may be misleading,

since no aircraft leasing charges are shown. During this eleven month period, TCA operated 3,120 flight hours with its L-749 aircraft, leased from California Airmotive at a rate of \$100 per flight hour to cover aircraft leasing and overhaul charges, plus \$50 per hour for maintenance. But only about \$65,000 are shown in this income statement for aircraft maintenance (rather than \$156,000); and the entire \$312,000 leasing/overhaul charge is missing. It seems clear that the income statement significantly understated TCA's true expenses and that the company did suffer a serious loss during this period. Whether TCA's loss for these eleven months should be attributed to low fares or to other factors cannot be deduced from these data. It is relevant however, that during more than two years of operations, TCA failed to achieve a 50 percent load factor; therefore, it seems proper to conclude that important factors other than low fares contributed to its losses.

Mercer Enterprises was one of the two surviving intrastate carriers as of December 31, 1965. Mercer's income statements for 1964 and 1965 show total operating revenues of \$128,000 and \$177,000, respectively, with common carrier revenues being essentially constant at \$69,000 and \$66,000. An operating profit of almost \$41,000 was earned in 1964, with net income before taxes of \$38,000. Nineteen sixty-five shows an operating loss of \$2,349 with a net income before taxes of just over

\$12,000, due largely to capital gains. Income taxes are not shown since Mercer Enterprises was a sole proprietorship during those years and it is not possible to calculate income taxes without information regarding the owner's personal tax status. Also, the expenses for these two years do not include the manager's (owner's) salary.

One reason for the 1965 loss is that Mercer incurred substantial expenses in inaugurating a contract service with the U.S. Military Air Transport Service. In the first six months of 1966, military contract revenues were \$250,000 out of a total of \$339,000 with a net income before taxes of \$62,750.

Obviously, Mercer's common-carrier service is only one part of its total operation, but the fact that it has retained this very short-haul, weekend scheduled service implies that is is economically viable, even though offered under low fares.

Table 10-1 summarizes the financial information for PSA. This table shows that in every year for which information is available PSA made an operating profit and also earned a profit after taxes. True, the profit for 1960 was nearly zero, but this was the first full year of PSA's Electra operations and the year the FAA ordered this aircraft operated at reduced speeds pending the modification of its wing and engine support structure. During this period many passengers shunned the Electra (regardless

of the airline operating it). The abnormal situation of that year is emphasized by the large profits PSA earned in the preceding and subsequent years.

The operating ratios given in Table 10-1 appear to have been related to the type of aircraft operated by PSA. Those for both 1950 and 1955 were around 96 percent. During those two years PSA operated DC-3 aircraft (DC-4's were introduced on November 10, 1955), its fare level was virtually the same (its Burbank-San Francisco/Oakland fare was \$9.95 in 1950 and \$9.99 in 1955), and it operated over about the same route structure. Thus, it appears that the effects of inflation were balanced by economies resulting from increases in the volume of output and from greater experience in operating DC-4's, and that 96 percent was about as low a ratio as could be attained with DC-3's under such low fares. The operating ratios for DC-4 service started at 94.7 percent in 1956 and fell each year until reaching 81.0 percent in 1959; however, this reduction was helped by the April 14, 1958, fare increase. The introduction of Electras on November 20, 1959, ushered in a new era in PSA's operating ratios. Starting at 99.7 percent in 1960, by 1964, the last full year of all-Electra service, the ratio had declined to 71.4 percent, due in part to the fare increase of December 12, 1960, which raised the Los Angeles-San Francisco fare from \$11.81 to \$13.50. The mixed

Table 10-1

Selected Financial Data, Operating Ratio, and Return on Stockholder Equity
Pacific Southwest Airlines, Various Years 1950-1965

Year	Total Operating		Profit after Taxes ^a	Stockholder Equity ^b	Operating Ratio ^c	Return on Stockholder Equity ^d
	Revenues	Expenses				
1950	\$ 505,988	\$ 489,939	n.a.	n.a.	96.8%	n.a.
1955	1,587,697	1,523,385	\$ 243,997 ^e	n.a.	95.9	n.a.
1956	2,264,850	2,144,385	58,588	n.a.	94.7	n.a.
1957	3,126,254	2,727,079	196,606	\$ 86,550	87.2	227.2%
1958	3,929,921	3,267,309	322,031	n.a.	83.1	n.a.
1959	4,775,993	3,867,215	455,901	1,057,609	81.0	43.1
1960	8,130,483	8,109,688	499	n.a.	99.7	0.0
1961	10,300,293	9,173,116	310,483	n.a.	89.1	n.a.
1962	14,204,915	10,803,179 ^f	1,368,770	3,007,734	76.1	45.5
1963	17,852,448	12,900,409 ^f	2,251,719	7,429,810	72.3	30.3
1964	20,773,372	14,827,433	2,945,881 ^g	10,075,046	71.4	29.2 ^g
1965	24,015,261	19,605,184	2,034,932 ^g	11,504,770	81.6	17.7 ^g

n.a.—not available.

^aProfit after taxes and special items.

^bAs of December 31, of each year.

^cTotal operating expenses divided by total operating revenues.

^dProfit after taxes and special items divided by stockholder equity.

^eIncludes gain of \$206,150 on sale of DC-3 aircraft. Excluding this gain yields profit after taxes for 1955 of \$37,847.

^fReported total operating expenses reduced by \$100,000 (1962) and \$55,000 (1963) by deletion of investment tax credit that was added to provision for obsolescence and depreciation during those years.

^gIncludes provisions for investment tax credit.

operation of Electras and B-727-100's in 1965 raised the operating ratio to 81.6 percent, and its reduction to 76.8 percent in 1966 seemed to maintain the old pattern. The ratio increased, however, to 83.8 and 86.1 percent in 1967 and 1968, when the Electras were retired and PSA's fleet was expanded to include DC-9-30's, B-737-200's, and B-727-200's. Thus, the decreasing trend found with DC-4's and Electras has yet to be established with PSA's all-jet operation.

The very limited information regarding return on stockholder equity suggests an outstanding performance for the years since 1957 (again with the exception of 1960). The 227 percent return of 1957 was due as much to the very low level of stockholder equity for that year (about \$87,000) as to the level of profits. But the 43.1 percent return in 1959 was with stockholder equity of over \$1 million, and the 45.5 percent return in 1962, was on an equity base of \$3 million. These rates of return were too high to sustain, especially in a market with open entry. In fact, these high returns are consistent with the new entry that occurred in 1962 after a seven-year hiatus, and with Western's introduction of Thriftair service in that same year. However, the 30 percent return of 1963 and 1964, and even the 17.7 percent return of 1965, are still outstanding.

PSA Compared with the Certificated Carriers

The certificated trunk and local service carriers' operating ratios and returns on stockholder equity provide yardsticks with which to evaluate PSA's performance. The operating ratios for total trunk and total local service carriers are presented in Table 10-2, together with those for Western Air Lines, Pacific Air Lines (the local service carrier), and PSA. The data for Western and Pacific are presented because they, of all the trunk and local service carriers, had the greatest portions of their operations within California and, so, are more likely than other certificated carriers to be affected by the regional factors (if any) affecting PSA.

A comparison of the median and range for each of these series of operating ratios shows that the trunk carriers generally had lower ratios than did the local service carriers, despite the relatively large direct subsidy payments received by the local service carriers. Within the trunk carrier group, Western usually enjoyed below average (superior) operating ratios (a median value of 88.7 percent for Western vs. 92.0 percent for all trunk carriers). Similarly, during these 17 years, Pacific's median ratio was 95.0 percent, compared with 98.3 percent for all local service carriers. Until late 1955, PSA, operated the same type DC-3 aircraft that Pacific and the other local service

carriers operated during those same years. Thus, it is not surprising to find that PSA's operating ratios were similar to those of Pacific and of all local service carriers during this period, despite the large subsidies received by the local service carriers. The impact of four-engine aircraft can be seen in PSA's ratios for 1957 (the second full year of its DC-4 service) and operating ratios of the trunk carriers and Western, even though PSA's fares per mile were significantly lower than those of these larger carriers, and it did not receive any air mail revenue. Overall, to the extent that operating ratios indicate efficiency, it appears that PSA was generally more efficient than the trunk or the local service carriers. Not only did it have the lowest median operating ratio (85.2 percent) but the interval of its range (28.3 percentage points) exceeded Western's interval (19.2 percentage points) as well as the interval for the total trunk carriers (16.6 percentage points).

The returns on stockholder equity for these same carriers and carrier groups are summarized in Table 10-3. These data show that, at least since 1957, PSA has generally achieved higher rates of return than those of the certificated carriers. Rates above 30 percent appear to have been common for it in contrast to the highs of 21.6 percent for total trunk carriers, 25.5 percent for

Table 10-2

Operating Ratios for Total Trunk and Local Service Carriers
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
1949-1965

Year	Operating Ratio ^a				
	Trunk Carriers ^b		Local Service Carriers		PSA
	Total	Western	Total	Pacific	
1949	94.6%	92.2%	102.1%	94.4%	n.a.
1950	88.1	88.7	97.8	88.2	96.8%
1951	83.9	83.4	97.9	98.4	n.a.
1952	87.6	83.8	102.6	95.0	n.a.
1953	89.9	88.7	103.1	104.0	n.a.
1954	89.8	92.3	97.1	92.2	n.a.
1955	89.2	85.9	98.8	96.0	95.9
1956	92.0	90.8	100.9	103.1	94.7
1957	97.0	88.1	100.9	100.9	87.2
1958	93.7	95.9	98.3	103.4	83.1
1959	94.1	81.5	99.5	97.5	81.0
1960	98.2	90.9	98.5	102.8	99.7
1961	100.5	97.6	94.7	91.6	89.1
1962	96.7	90.6	93.5	93.8	76.1
1963	94.7	81.5	94.7	95.0	72.3
1964	89.4	78.4	93.3	90.2	71.4
1965	87.2	82.4	91.7	90.0	81.6
Median	92.0	88.7	98.3	95.0	85.2 ^c
Range	83.9-100.5	78.4-97.6	91.7-103.1	88.2-104.0	71.4-99.7*

n.a.—not available.

*Estimated.

^aTotal operating expenses divided by total operating revenues.

^bDomestic operations only.

^cBased on data for 12 years rather than 17 years.

Table 10-3

Return on Stockholder Equity for Total Trunk and Local Service Carriers
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
1951-1965

Year	Return on Stockholder Equity ^a				
	Trunk Carriers ^b		Local Service Carriers		PSA
	Total	Western	Total	Pacific	
1951	17.9%	17.5%	13.5%	6.6%	n.a.
1952	18.5	15.0	-1.9	10.3	n.a.
1953	14.0	8.3	-6.3	-7.5	n.a.
1954	13.9	14.4	14.2	10.3	n.a.
1955	14.8	17.0	7.5	18.9	n.a.
1956	11.9	22.5	-4.4	-6.6	n.a.
1957	4.8	15.5	-11.4	2.1	227.2%
1958	7.7	9.2	10.7	-7.2	n.a.
1959	9.6	24.8	0.5	23.6	43.1
1960	0.0	8.5	14.8	-10.9	0.0
1961	-5.2	2.2	21.2	15.2	n.a.
1962 ^c	1.2	11.7	19.2	6.1	45.5
1963 ^c	1.9	21.6	13.0	-0.9	30.3
1964 ^c	17.1	25.5	16.3	26.4	29.2
1965 ^c	21.6	19.6	19.3	14.2	17.7
Median	11.9	15.5	13.0	6.6	n.a.
Range	(-)-5.2-21.6	2.2-25.5	(-)-11.4-21.2	(-)-10.9-26.4	0.0*-227.2*

n.a.—not available.

*Estimated.

^aProfit after taxes and special items divided by stockholder equity. The certificated carriers' return is based on the arithmetic mean of stockholder equity at the end of the 12-month period a year ago and at the end of each quarter of the current 12-month period. PSA's return is based on stockholder equity as of December 31, of each year.

^bDomestic operations only.

^cIncludes provisions for investment tax credit.

Western, and in comparison with the 18 percent cost of equity specified by the CAB as being fair and reasonable for the smaller trunk carriers. The negligible return of 1960 was due to the Electra problem and was not repeated in subsequent years; 1965 seems to be the only other year during the period studied when PSA's rate of return was below those of the two total carrier groups and Western. The 1965 results are not surprising, however, considering greatly increased service and price rivalry given PSA by United and Western and the addition of five B-727-100's to PSA's fleet between April and August 1965, thereby more than doubling its capacity and incurring the costs of introducing a new aircraft type.

Conclusion

This section shows that it has been possible for some airlines to survive and operate profitably within California under relatively low fares. Indeed, the fact of survival is persuasive evidence of the viability of such fares. PSA was consistently the intrastate carrier with the lowest fares and it survived and prospered throughout the period studied; California Central did well for several years before succumbing to the effects of such actions as an independent fare increase, a costly aircraft lease, and a strike; Mercer was successful in providing a very limited service at low fares; and several

carriers operated until having to terminate service because of noneconomic factors. In addition, the actions of United and Western in the early 1950's and, again, in 1962-65 show that they preferred to offer low-fare service rather than accept a declining traffic share in the major markets. Overall, four or more carriers have consistently operated in the Los Angeles-San Francisco and Los Angeles-San Diego markets, whereas three or four carriers have operated between San Diego and San Francisco. Clearly, fares per mile substantially below those resulting from the CAB's across-the-board fare increases have proved to be high enough to attract and support extensive airline service in the major California markets ever since 1949.

Table 2 indicates what the fare structure was in the major California markets. Similar low-fares existed in the minor markets as well. The 1949 data compares the first class fares charged by the certificated carriers with the coach fares of the intrastate carriers. The 1965 data compares the intrastate fares with hypothetical coach fares of the certified carriers computed on the same basis as their intrastate fare structure. In reality, the interstate carriers were forced to meet the lower fares of the intrastate carriers because of competitive pressures.

TABLE 2

Fares Differences in Major California Markets

Market	Aircraft Type	1949			1965		
		Cert. FC	Calif. C	% Lower	Cert.Hyp.C.	Calif. C	% Lower
LAX-SFO	Prop. Jet	\$21.05	\$ 9.99	52.5	\$21.70	\$11.43	47.3
		-	-	-	23.70	13.50	43.0
LAX-SAN	Prop. Jet	6.75	5.55	17.8	9.45	6.35	32.8
		-	-	-	10.90	6.35	41.7
SAN-SFO	Prop. Jet	27.80	15.54	44.1	27.15	17.78	34.5
		-	-	-	29.25	19.85	32.1
Range				17.8 - 52.5%		32.1 - 47.3%	

COSTS

Introduction

How was it possible for Pacific Southwest Airlines (PSA), Mercer Enterprises, and some of the other intrastate carriers to achieve profits with low fares per mile when the certificated carriers required much higher fares per mile to earn profits from their interstate operations? There appears to be no one simple answer to this question, and it seems likely that many large and small differences in operating practices combined to enable the surviving intrastate carriers to operate at lower costs than the certificated carriers. Indeed, one would expect that the ability of an airline to achieve low average costs would have a particularly high survival characteristic in the California markets where fares were low and where entry and exit were unimpeded by government regulation.

On the other hand, it may be that operating conditions in the major California markets (and in similar high-density interstate markets) naturally yield average costs that are lower than those attainable in smaller markets, so that the certificated and intrastate carriers' costs were about the same in these markets while being substantially different on a system-wide basis. If this is correct, it follows that the almost universal

application of the Civil Aeronautics Board's fare policies and increases to all markets, regardless of their cost characteristics, results in large profit potentials in California-type interstate markets, even greater profit potentials in high-density, long-haul markets, and, of course, only low profits or even losses in short-haul, low-density markets.

Actually, low-cost carrier operations and low-cost markets are not mutually exclusive, and both could have existed within California during the period under study. That is to say, the intrastate carriers may have been lower cost operators than the certificated carriers, and the major California markets may have been served by all carriers at costs that were lower than those required to serve smaller markets. Information is not available with which to investigate the direct effects of market characteristics on airline costs.

Implications Regarding Economies of Scale

The financial data and the experience of the California intrastate carriers indicate that most economies of scale attainable in airline operations can be achieved by small airlines operating a few aircraft over small (in terms of the number of cities served) route structures. If large operations are required to achieve major economies of scale, then the operating ratios of

PSA should have been higher than those of Western (which has always been much bigger than PSA) and even higher than those of Pacific ~~druing~~ during the 1950's (when Pacific was bigger than PSA). This was not the case, however. PSA's operating ratios were generally equal to Pacific's during the years they both operated DC-3's (despite Pacific's larger size, higher fares, and subsidy receipts), and they were consistently lower than Western's once PSA adopted four-engine aircraft.

It might be argued that PSA's lower operating ratios for 1957-59 compared with 1950 and 1955, and its even lower operating ratios for 1961-64, provide evidence of increasing economies of scale. As discussed above, however, these lower operating ratios appear to be associated with the type of aircraft operated (DC-3, DC-4, or Electra rather than with the size of operations. Note that throughout these years PSA's fleet never exceeded six aircraft. In fact, PSA never operated more than four DC-3's at one time (from August 1952 to November 1955), and four was the maximum number of DC-4's in its fleet (from June 1957 to December 1959). Would anyone arguing that domestic airlines experience significant economies of scale be content to set the top limit of such economies during this period at the output of six aircraft?

The survival over significant time periods of Mercer Enterprises and California Central Airlines (with total revenues of \$128,000 and \$177,000 for Mercer in 1964 and 1965, and from \$1 to \$2 million for CCA during 1950-54) provides additional

evidence that important economies of scale can be achieved by small carriers. The fleets of these and other intrastate carriers were miniscule in comparison with those of the trunk carriers during the same time periods. Yet, it was possible for some of these small intrastate carriers to be profitable with fares per mile much lower than those of the certificated carriers.

Overall, the evidence provided by the intrastate carriers relative to the certificated carriers seems to be consistent with decreasing rather than increasing economies of scale. In any case, it is certainly inconsistent with the hypothesis that there were significant economies of scale in U.S. domestic airline operations through the mid- 1960's over those attainable with, say, five aircraft of a given type.

If this is indeed true, it becomes obvious that the CAB's control of entry has been very important to the existing certificated carriers. Without such entry control the experience of the California intrastate carriers implies that many more carriers would now be operating within the U.S. and that many other carriers would have operated at various times over a large number of small, simple route structures. This, of course, would have increased the rivalry that the "grandfather" carriers would have otherwise experienced after 1938. There is little question that nonregulated airlines would not have evolved into a natural monopoly because of economies of scale. Quite the

contrary, a prediction of fragmentation seems to be more reasonable than one of concentration.

If only very large airlines had been able to survive while providing low-fare service, this would provide evidence that economies of scale exist in the airline industry. The fact is, however, that the smallest of airlines introduced low-fare service and that at least one of these managed to survive while achieving operating ratios and returns on stockholder equity comparable or superior to those of the much larger certificated carriers operating under substantially higher average fares per mile. This indicates that there are no significant economies of scale in domestic air transportation that cannot be achieved by a carrier operating four or five aircraft of a suitable type over a small route structure. It follows from this that without regulation the U.S. airline industry would probably consist of many small carriers rather than a few very large ones.

Resource Utilization

It is also possible to study differences in carrier operating practices to determine whether they were an important source of differences in operating costs. This section will be devoted first to examining differences in aircraft utilization, and then to examining differences in personnel productivity.

Together, these two types of resources - aircraft (capital) and personnel (labor) - provide the major inputs purchased by airlines; therefore, they probably account for a substantial part of the cost differences attributable to carrier operating practices.

Aircraft Utilization

The following three measures indicate the overall intensity with which aircraft are utilized by airlines:

1. The average number of revenue hours per day that each aircraft is operated (a measure of airframe utilization).
2. The number of seats installed in each aircraft type for a given class of service (which indicates the extent to which the aircraft's interior is used).
3. The average passenger load factor (which measures the degree to which the installed seats are utilized).

If a carrier flies its aircraft more hours each day, installs more seats in a given aircraft type for some class of service, and sells a higher percentage of those seats on each flight than other carriers, then it clearly utilizes its aircraft resources more intensively than the other carriers. In the following three subsections, the certificated and the intrastate carriers will be compared with respect to these three measures.

Revenue Hours per Aircraft per Day

Table 11-1 presents much of the fragmentary information that is available regarding the average number of revenue hours per day that the intrastate carriers operated their aircraft. In addition, comparable data for the certificated trunk and local service carriers are also presented. These data show that in 1964 three of the intrastate carriers had much lower daily aircraft utilizations than PSA, the trunk carriers, or the local service carriers. Of these three, California Time (with 1.8 hours per aircraft per day) was a short-lived carrier that obviously failed to find a significant demand for service between San Jose/Oakland, Burbank and Palm Springs. Since Mercer operated scheduled service only on weekends, its 0.8 hour per aircraft per day is not surprising. Daily service would have increased its aircraft utilization (but not necessarily its passenger load factor). Trans California's low utilization rate of 2.1 hours per day was due to its leasing arrangement with California Airmotive, whereby it agreed to keep four to five aircraft maintained and operable so that they would be immediately available for sale should such an opportunity present itself. Actually, two aircraft could have adequately covered its schedule pattern and would have brought its average aircraft utilization up to almost five hours per day.

Table 11-1

Average Number of Revenue Hours per Aircraft per Day
Certificated and California Intrastate Carriers
All Services, Selected Years 1952-1964

Year	Average Number of Revenue Hours per Aircraft per Day ^a						
	Total Certificated		California Intrastate				
	Trunk	Local Service	CCA	CTA	Mercer	PSA	TCA
1952	7.3	6.0 ^b	5.4	—	—	8.0	—
1955	7.7 ^c	6.0	n.a.	—	—	7.3	—
1958	7.5	6.5	—	—	—	6.6	—
1961	5.9	5.4	—	—	—	7.0	—
1964	6.5	5.5	—	1.8 ^d	0.8 ^e	8.7	2.1 ^f

n.a.—not available.

^aCalculated by dividing the number of aircraft days assigned to service into revenue aircraft hours flown.

^bScheduled service only.

^cExcludes a small number of hours flown by Eastern with aircraft not assigned to its fleet. Also, excludes National's helicopter operation.

^dCalifornia Time Airlines operated from September 19, 1964, through February 1, 1965. This figure applies to this entire period.

^eMercer Enterprises inaugurated scheduled service on or about April 18, 1964. This figure applies to its first full 12 months of operation from May 1964 through April 1965.

^fTrans California Airlines terminated service on October 7, 1964. This figure applies to its operation from January 1 through October 7, 1964.

In contrast to these cases of very low aircraft utilization, the two largest intrastate carriers - California Central and PSA- appear to have been able to achieve utilizations generally equal to or above those of the local service carriers and quite comparable to the averages for the trunk carriers. While PSA had a higher average daily utilization than the trunk carriers in three out of the five years given in Table 11-1, its 6.6 to 8.7 hours per aircraft per day always fell within the annual range of daily aircraft utilization by the individual trunk carriers. Similarly, California Central's 5.4 hours per day in 1952 was close to the lowest individual trunk carrier's (TWA) daily utilization of 5.7 hours for that same year. Since the trunk carriers' routes have always been longer than those of the intrastate carriers, their average stage lengths have been greater, and longer flights tend to increase average daily utilization (by decreasing relative ground time). The intrastate carriers, therefore, may be penalized somewhat by a system-wide comparison with trunk carriers. At the same time, the intrastate carriers' average stage lengths have been greater than those of the local service carriers, thereby improving their showing relative to that group. Overall, it seems proper to conclude that, aside from identifiably unique situations, the intrastate carriers utilized their aircraft about as intensively as the trunk carriers, and did somewhat better in this respect than most local service carriers.

Number of Seats Installed per Aircraft

A different situation emerges with regard to the number of seats installed in each aircraft. First, the intrastate carriers operated very little of what might be classified as first-class service. Aside from Pacific Air Lines' (the intrastate carrier) service in 1946-47, all intrastate carrier aircraft were operated in essentially high-density configuration, whereas the certificated carriers operated a large number of aircraft in low-density, first-class configuration. This alone served to increase the average number of seats installed in the intrastate carriers' aircraft compared to the average number of seats in similar aircraft operated by the certificated carriers.

Putting aside the effects of class of service on the average number of seats per aircraft, a direct comparison between coach-configured aircraft shows that significant differences existed in the seating configurations of the carrier groups. As can be seen from the data in Table 11-2, with the exceptions of California Central's DC-4, PSA's initial DC-4 configuration, and the L-049's, the intrastate carriers consistently installed more seats in their aircraft than the certificated carriers did in their coach versions of the same aircraft.

The relatively short routes and flight stage lengths of the intrastate carriers may facilitate the installation of more seats in a given cabin area since passenger comfort and payload restrictions are less critical on such stage lengths than they are on the longer stage lengths over which the certificated carriers operate their aircraft outside of California. Both United and Western, however, assigned special aircraft to serve just the major California markets, and even these aircraft had seating configurations that were not as dense as those adopted by PSA. Western's DC-6B Thriftair aircraft contained 92 seats, compared to the 98 seats PSA installed in its DC-6B; and United's B-727-100 Jet Commuter aircraft had 113 seats, compared to the 122 in PSA's B-727-100's. These differences of 6.5 and 8 percent are not tremendously large, but they are similar to the other differences shown in Table 11-2, thereby indicating that the certificated carriers did not limit the number of coach seats because of their longer stage lengths.

Given the strict physical dimensions of the interior of any aircraft, and given the consistency with which the intrastate carriers installed more coach seats within each aircraft type, it is clear that these carriers did utilize the cabins of their coach-configured aircraft more intensively than did the certificated carriers. When the certificated carriers' first-class or mixed-class configured aircraft are included to provide

RESOURCE UTILIZATION

Table 11-2

Coach Seating Configurations for Aircraft Operated within California
by Both the Certificated and the California Intrastate Carriers
1949-1965

Aircraft Type	Certificated		California Intrastate		Intrastate % of Certificated
	Carrier	No. of Seats	Carrier	No. of Seats	
DC-3	United	- ^a	CCA	28 & 32	—
	Western	- ^a	PSA	28 & 31	
	Pacific	- ^a	Others	28	
M-202	Pacific	40	CCA	44	110%
DC-4	TWA	62	CCA	60	97-111
	United	64 & 66	PSA	62 & 70	
	Western	66	Others	73	
L-049	TWA	80 & 81	Futura	81	100-101
			Paradise	81	
L-749	TWA	- ^b	TCA	98	—
DC-6B	United	79	PSA	98	103-124
	Western	87, 92, 95			
Electra	Western	94 & 96	PSA	98	102-104
B-727	United	113	PSA	122	108

^aThe certificated carriers did not operate their DC-3's in coach configuration within California. United and Western installed 21 first-class seats in their DC-3's, while Pacific installed 28 such seats.

^bTWA did not operate its L-749's in coach configuration within California. Its maximum first-class seating configuration for L-749's was 55 seats.

AIRLINE REGULATION IN AMERICA

Table 11-3

Average Annual Passenger Load Factors
for the Certificated and California Intrastate Carriers
Scheduled Service, 1946-1965

Year	Passenger Load Factor (Percent)			
	Certificated Trunk		Total Cert. Local Service ^a	Total Intrastate ^b
	First Class	Coach		
1946	78.8%	—	37.9%	n.a.
1947	65.7	—	29.8	n.a.
1948	58.5	72.9% ^c	27.1	—
1949	58.7	70.2	28.2	66.9
1950	61.2	74.2	31.5	73.9
1951	68.9	74.5	37.4	69.0
1952	65.3	75.6	37.5	65.9
1953	62.2	72.8	38.6	67.1
1954	61.2	68.2	42.2	69.2
1955	62.3	67.6	45.2	72.2
1956	62.4	67.3	45.8	75.7
1957	59.4	65.1	45.2	80.6
1958	58.9	61.7	45.7	72.4
1959	59.5	64.1	44.4	71.1
1960	56.1	63.3	41.9	71.1
1961	51.6	60.2	41.6	72.1
1962	46.6	57.6	42.3	75.3
1963	51.7	54.9	43.8	72.8
1964	49.9	57.8	46.4	74.9
1965	49.0	57.7	47.3	63.3

n.a.—not available.

^aSome local service carriers operated small amounts of coach service in 1952-53 and from 1956 to early 1965. Their coach load factors were generally above their first-class load factors and, overall, equaled 51.3 percent. However, due to the limited quantity of coach service, the total local service load factor was no more than 0.3 percentage points above the first-class load factor in any one year.

^bPartially estimated, includes all services.

^cCoach service inaugurated November 4, 1948.

fleet-wide comparisons, the intrastate carriers' relative cabin utilization becomes even more intensive than that of the CAB-regulated airlines.

Passenger Load Factors

The final measure of aircraft utilization to be considered is average annual load factor - the percentage of total seats flown that were actually occupied by revenue passengers. Table 11-3 presents load-factor data for the three carrier groups from 1946 through 1965, and shows that the trunk carriers' first-class load factors ranged downward from 78.8 percent in 1946 and 68.9 percent in 1951, to a low of 46.6 percent in 1962. In comparison, their coach load factors ranged from 75.6 percent (1952) to 54.9 percent (1963) and were consistently 3 to 14 percentage points higher than those for their first-class service. Because the low average load factors for the local service carriers set them apart from the other two carrier groups, they will not be considered further in this section. It should be noted, however, that their low load factors are consistent with their large subsidy payments. If the local service carriers' subsidy payments were converted to passenger equivalents, their resulting passenger-plus-subsidy load factors would be much higher than their actual load factors.

The most significant comparison is between the trunk carriers' coach load factors and the total load factors for the California intrastate carriers. From 1949 through 1953 (the end of the Korean War), the trunk carriers' coach load factors were generally above those of the intrastate carriers. Overall, during those five years the trunk carriers managed to fill 73.9 percent of their available coach seat miles, compared to the 69.8 percent the intrastate carriers filled (disregarding the denser seating configurations of the California carriers' aircraft). In every year following 1953, however, the California intrastate carriers' average load factor exceeded that for the trunk carriers' coach service by amounts ranging from 1.0 percentage point in 1954 to 17.9 percentage points in 1963. From 1955 through 1964, the intrastate carriers' average annual load factor never fell below 70 percent and reached a high of 80.6 percent in 1957. Over the 12-year period from 1954 through 1965, their weighted mean load factor was 71.2 percent, compared to a 12-year average of only 59.1 percent for the trunk carriers' coach operations - a difference of 12.1 percentage points.

As was discussed above in relation to cost differences, it may be that these large load-factor differences were due primarily to the differing characteristics of the markets served by the two carrier groups, or they may have been due in large part to different operating procedures resulting from management decisions

and policies that were quite independent of market characteristics. The best way to test which of these was the primary reason would be to compare the load factors of all turnaround flights operated by the certificated and intrastate carriers solely in the three major markets - that is, flights scheduled to serve mainly local traffic. Large differences in the load factors of such flights would imply that management decisions were primarily responsible for the carriers' performance, whereas inconsequential differences would indicate that market characteristics were the important factor. Unfortunately, such detailed information is not available. In fact, only system-wide load factor data are publicly available for the certificated carriers, and one of the intrastate carriers had a policy of not divulging information that would permit the direct calculation of even its system-wide load factors. It is therefore necessary to rely upon indirect analyses to investigate the reasons for differences in overall coach load factors.

Several factors serve to indicate that different market characteristics were not the primary reason for the trunk carriers' lower coach load factors. First, prior to the widespread adoption of dual-configured jet aircraft in the early 1960's. the trunk carriers confined coach service to their high-density markets and provided only first-class service in relatively low-density markets. From 1954 through 1959, coach traffic accounted for 33 to 44 percent of total trunk RPM, but even in this period the

1

trunk carriers' coach load factors ranged from 1.0 to 15.5 percentage points under those of the intrastate carriers.

Second, the intrastate carriers also served several minor markets within California. Although the three major California markets did generate most of the traffic carried by the intrastate carriers as a group, it appears that the overall range of traffic densities for markets having coach service was greater for the intrastate carriers than for the trunk carriers. During the period studied, trunk carriers did not operate coach service in markets as small as Burbank-Inyokern, Lake Tahoe-Oakland/San Jose, or Burbank-Brown Field, etc.

Finally, a comparison of system load factors for individual intrastate carriers shows that high average load factors were achieved in minor as well as in major markets. For example, Paradise achieved load factors of about 69 percent in its Lake Tahoe-Oakland/San Jose service during 1963 and early 1964, while Mercer Enterprises' load factor between Burbank and Brown Field was about 76 percent from April 1964 through 1965. In contrast, Trans California's average load factor was just 44 percent during its more than two years of service in 1962-64, even though it operated in the relatively major markets of Oakland-Burbank-Los Angeles-San Diego. These performances are inconsistent with the hypothesis that high load factors result from serving high-density markets.

In contrast to the above findings, it seems reasonable to conclude that management decisions do play an important role in determining load factors. In the first place, high load factors could "easily" be achieved by the certificated carriers if all of their managements "simply" adopted the policy that flights would not be scheduled if they did not consistently operate at, say, a 70 percent load factor. Given various marketing (demand-increasing) activities that could be implemented, varieties of aircraft that could be utilized, levels of service quality that could be offered, and the relatively high marginal revenue resulting from the certificated carriers' fare level and structure, such a policy would probably not yield maximum profits, but it would increase average load factors. Another way to do this would be to lower the fare level. As fares decreased, greater numbers of passengers would be required on each flight in order to equate marginal revenues with marginal costs (other things held constant), and airline managers would be motivated to schedule flights to achieve higher load factors in order to maximize profits under the new fares. (Conversely, increases in fare levels would promote lower load factors). Of course, the differences in fare levels for the certificated and intra-state carriers are consistent with the observed differences in load factors between these carrier groups. Still another

discretionary way to increase load factors would be to change the number of scheduled flights in accordance with daily, weekly, and seasonal (annual) fluctuations in traffic. Thus, fewer flights would be scheduled to depart at 3 A.M. than at 8 A.M. each day, fewer flights would be operated on Saturdays than on Fridays and fewer daily flights would be scheduled during February of any year than during the following August when traffic is at its seasonal peak.

It happens that some data are available regarding traffic and schedule fluctuations in the three major California markets that support the hypothesis that management decisions did play a significant role in the intrastate carriers' achievement of relatively high load factors. PSA reported that Friday and Sunday each accounted for something over 21 percent of its total weekly traffic, with the other five days each accounting for between 10.5 and 13.0 percent. Generally speaking, business travel predominates on Monday through Thursday, then on Friday and Sunday afternoons and evenings there is a large volume of weekend personal and pleasure travel which results in traffic peaks. Given such a predictable weekly traffic fluctuation, a concurrent fluctuation in schedules should yield a higher average load factor than if the same number of flights were distributed equally over the week so that 14.3 percent of total weekly flights were operated each day.

Table 11-4 gives the percentage of total weekly seats scheduled on Friday and Sunday (combined) in the three major California markets by the certificated and California intrastate carriers at various times from 1948 to 1965. This table shows that the certificated carriers' schedules were much less responsive to weekly traffic fluctuations than were those of the intrastate carriers. Indeed, it turns out that the median percentages of weekly seats operated by the certificated carriers on Friday and Sunday were 28.6 and 28.7 percent for both first-class and coach service in all three markets. This is the percentage that would be obtained if all flights were operated seven days a week - that is, $2/7=28.6$ percent. In contrast, the intrastate carriers' Friday and Sunday median percentages were 35.8 percent for Los Angeles-San Francisco, 28.1 percent for Los Angeles-San Diego, and 31.2 percent for San Diego-San Francisco.

The intervals of the ranges for each series in Table 11-4 provide an even better idea of the relative scheduling flexibility of the two carrier groups. With two exceptions, the intervals for the certificated carriers are smaller than three percentage points, thereby indicating only small changes in scheduling practices over these years. In comparison, the intervals for the intrastate carriers were 14.4, 11.7, and 9.8 percentage points. Obviously, the intrastate carriers varied their weekly schedules much more than the certificated carriers did.

RESOURCE UTILIZATION

Table 11-4
Percentage of Total Weekly Seats Scheduled on Friday and Sunday^a
in the Three Major California Markets
by the Certificated and the California Intrastate Carriers
Selected Dates 1948-1965

Date	Percent of Total Weekly Seats Scheduled on Friday and Sunday ^a								
	LAX/BUR-SFO/OAK ^b			LAX/BUR/LGB/ONT-SAN			SAN-SFO/OAK/SJC		
	Certificated		Intra-	Certificated		Intra-	Certificated		Intra-
	First	Coach	state	First	Coach	state	First	Coach	state
8/ 1/48	28.7%	—	—	28.6%	—	—	28.6%	—	—
7/31/49	28.4	—	30.3%	24.4	—	29.6%	28.6	—	29.6%
3/ 1/51	28.7	30.8%	35.8	29.4	—	27.7	29.1	—	28.4
9/ 1/52	28.4	28.6	37.4	28.6	28.6%	29.7	28.6	28.6%	34.0
9/ 1/53	28.7	28.6	39.2	28.6	28.6	31.6	28.6	28.6	35.0
12/ 1/54	28.6	28.6	39.2	28.2	28.6	29.6	27.1	28.6	32.8
8/ 1/55	29.1	30.1	35.2	28.6	28.6	28.3	27.6	28.6	32.1
8/ 1/56	29.1	30.0	35.8	28.6	28.6	20.0	28.6	28.6	29.4
8/ 1/57	28.3	30.3	42.4	27.9	28.6	28.1	29.7	28.6	35.9
8/ 1/58	29.2	28.5	44.7	28.2	28.8	31.7	29.1	28.6	37.9
8/ 1/59	29.1	28.2	31.1	28.3	28.8	29.7	27.1	29.1	35.0
8/ 1/60	28.7	28.2	38.6	28.6	28.8	24.4	29.9	29.6	31.1
8/ 1/61	28.9	28.6	38.3	27.5	29.2	23.7	28.6	28.4	28.1
8/ 1/62	28.4	28.5	36.1	28.6	28.8	24.6	28.6	27.8	29.2
8/ 1/63	28.0	28.5	35.0	28.2	29.3	29.3	23.1	23.1	33.1
8/ 1/64	28.2	28.6	33.1	28.5	28.6	23.1	—	26.9	28.6
10/ 1/64	28.5	29.0	33.1	28.6	28.8	23.1	—	26.9	28.6
8/ 1/65	29.2	29.6	33.1	28.1	28.2	25.8	—	28.2	31.2
Median	28.7	28.6	35.8	28.6	28.6	28.1	28.6	28.6	31.2
Range	28.0- 29.2	28.2- 30.8	30.3- 44.7	27.5- 29.4	28.2- 29.3	20.0- 31.7	23.1- 29.9	23.1- 29.6	28.1- 37.9

^aFlights scheduled to depart up to 2:30 A.M. on Saturday or Monday were considered to have been Friday or Sunday flights.

^bLAX/BUR/LGB/ONT-SFO/OAK/SJC.

Unlike the intrastate carriers' schedules for the two long-haul markets, a number of their Friday and Sunday percentages for the short-haul Los Angeles-San Diego market fell well below 28.6 percent. The lowest share was 20.0 percent (for 8/1/56), and the percentages for seven out of the last eleven dates were less than 28.6 percent. The low percentages for this market in these more recent years could have been due to a number of factors. First, the traffic pattern may have changed, reducing Friday and Sunday traffic. Such a reduction could have resulted from substantial improvements in freeways which might have encouraged automobile travel between these adjacent metropolitan areas. Second, personal and pleasure air travel may be relatively less important in this market, yielding a traffic low rather than a traffic peak on Fridays and Sundays. Third, it may be that PSA (the sole intrastate carrier in this market from 1957 through 1962) found itself short of aircraft and/or crews during these weekly peak periods and discovered that it was more profitable to concentrate its resources in the longer-haul markets. This could be particularly true of the period represented by 8/1/56, when PSA's total fleet consisted of only two DC-4's and when its Friday and Sunday percentage in this market fell to 20.0 percent. Regardless of whether the Friday and Sunday seat percentages were above or below 28.6 percent, the important fact is that the

intrastate carriers did vary their schedules much more than the certificated carriers. This variability in the intrastate carriers' schedules implies a conscious effort by their managements to adjust output to correspond to the different demands existing during the week, and the system load factors given in Table 11-3 indicate that they were successful in this endeavor. In comparison, the certificated carriers tended to ignore weekly traffic fluctuations in the major California markets. To the extent their California practices represent their scheduling policies in interstate markets, their relatively low annual load factors are also consistent with their chosen operating procedures.

It can be argued that PSA's (and the other intrastate carriers') traffic fluctuations differed significantly from those of the certificated carriers. The better-known certificated carriers may have attracted relatively more business travelers, whereas - due to their consistently lower fares - the intrastate carriers may have attracted more personal and pleasure travelers. Thus, the certificated carriers' traffic may have been more stable than that of the intrastate carriers. This explanation might apply to differences found in the 1950's, but with the introduction of Electra aircraft by PSA and the increasing demand for coach service for business travel, it would certainly not apply to the 1960's. Also, while there is no published data available, this writer knows from professional experience that the certificated

carriers do experience weekly traffic peaks on Fridays and Sundays. Evidence of this can be found in their provisions for the "family plan" and "Discover America" promotional fares which generally suspend these promotional fares from Friday noon through Friday midnight or Saturday noon, and from Sunday noon through Monday noon - the same periods during which PSA experienced its traffic peaks.

Overall, the evidence is most consistent with the hypothesis that the intrastate carriers' relatively high load factors are primarily the result of conscious scheduling decisions by their managements, decisions that may well have been imposed by the requirements for survival under the low fares in effect since 1949. At the same time, the certificated carriers' less flexible scheduling practices and lower load factors may reflect the higher fares authorized by the CAB, and the emphasis on service quality by all such carriers in their attempts to obtain larger shares of total traffic when price rivalry is precluded by CAB regulation.

Summary

Taken together, the three parts of this section show that the intrastate carriers generally utilized their aircraft resources more intensively than the certificated carriers. This greater utilization appears not to have been the result of flying each

aircraft more hours per day during the year. Rather, it resulted from the intrastate carriers generally installing more seats in each of their aircraft than the certificated carriers and then usually achieving higher load factors - that is, selling more seats on each flight. In addition, the offering of low-density, first-class service by the certificated carriers also served to decrease their overall aircraft utilization relative to the intrastate carriers.

Still another measure of aircraft utilization is the total number of years each aircraft is operated. It was pointed out in chapter 3 that the trunk carriers repeatedly purchased new aircraft to replace their existing aircraft, whereas, with the exception of PSA's Electras and B-727's, the intrastate carriers bought or leased used, obsolescent aircraft, most of which had been discarded by the trunk carriers. Thus, the intrastate carriers served to extend the productive lives of these aircraft, thereby increasing their overall utilization. This is another example of greater efficiency (increasing the output of a given resource) by the intrastate carriers. This efficiency was reflected in the low prices they paid for their used piston-powered aircraft which, in turn, served to lower their expenses.

The differences between the trunk and intrastate carriers in aircraft utilization appear to have been due more to differences

in operating practices determined by management decisions than to differences in market characteristics (especially when the comparison is limited to coach-type operations). Both seat installation and fluctuations in weekly schedule patterns are directly controlled by management. In addition, the observed load factor differences are also consistent with the relative fare levels of these two carrier groups - that is, lower fares require larger passenger loads to equate marginal revenues with marginal costs and thus maximize profits. In California, management decisions determined both fare levels and scheduling practices, and those who made the correct decisions were rewarded with the survival of their companies.

Relative Output per Employee

Several measures of employee productivity are used in the airline industry. For example, the CAB publishes the following "crude measures" of productivity:

1. Overall available ton-miles per employee.
2. Overall revenue ton-miles per employee.
3. Total operating revenues (excluding subsidy) per employee.

It is important to realize, however, that dividing some measure of total output by the total number of employees does not yield a measure of employee productivity. Rather, it indicates the

amount of output per employee resulting from the combined use of all inputs. These inputs include those purchased by the airlines (such as labor, aircraft, airport facilities, and fuel), as well as those whose costs are not borne directly by the carriers (for example, the airway, air traffic control, and weather services provided by the federal government). Even though output per employee does not indicate the absolute contribution of airline personnel to total output, it can be used to yield insights into relative employee productivity, providing comparisons are made between carriers or carrier groups whose proportions of labor to nonlabor inputs are roughly similar.

All airlines use the federal airways, lease airport facilities for their aircraft and traffic handling operations, and usually lease the land and buildings where they conduct their maintenance, sales, and administrative activities. These inputs, together with other supplies and services, are generally available to all carriers under equal or very similar terms, and the certificated and intra-state carriers appear to be comparable with regard to their use. This leaves aircraft as the most important nonlabor input by which the carrier groups might be differentiated. It turns out, however, that little difference seems to exist between the carrier groups in the use of this input relative to other capital inputs. For the years 1951 through 1965, the end-of-year book values of the

trunk carriers' flight equipment plus spare parts and assemblies (at cost and before depreciation) comprised between 81.2 and 89.1 percent of the undepreciated book values of their total operating property and equipment (the higher percentages apply to the 1960's). For the local service carriers, flight equipment plus spare parts and assemblies made up 78.3 to 89.4 percent of the total undepreciated book value of their operating property and equipment for these years. Comparable data are not available for any of the intrastate carriers except for PSA from 1962 to 1965. During these four years, PSA's flight equipment, etc., accounted for 89.4 to 93.9 percent of the undepreciated book value of its total operating property. Given a similarity in other nonlabor inputs, this apparent consistency in the dominance of aircraft over all real capital inputs means that if labor inputs are found to be roughly proportional to aircraft inputs it should be possible to use measures of output per employee to obtain fairly reliable estimates of relative labor productivity for these carrier groups.

An indication of the use of labor inputs relative to aircraft inputs may be obtained by dividing the total number of aircraft assigned to service for some period into the total number of employees for that period. The results of such a calculation for various years from 1949 through 1965 are presented in Table 11-5. The data in this table indicate that while California Central and PSA operated two-engine aircraft (through 1955), they utilized

around 30 employees per aircraft (this estimate excludes the 48 employees per aircraft for PSA in 1951, on the assumption that it was inflated by employees engaged in fuel sale and flying school activities). This figure is about 25 percent lower than that of the local service carriers through 1961, the period when those carriers were mainly operating similar two-engine aircraft.

PSA's adoption of DC-4's increased its number of employees per aircraft from around 30 to about 48 - somewhat more than that of the local service carriers but just half the number for the trunk carriers for 1952-58, when those carriers produced about three-quarters of their total available seat-miles (ASM) in four-engine propeller aircraft that were mainly larger and faster than PSA's DC-4's. Following its adoption of Electras, PSA employed around 88 persons per aircraft, but this was still only about 90 percent of the number of employees per aircraft that the trunk carriers utilized during 1952-58, while operating aircraft that were slower than the Electra. The further increase in the trunk carriers' number of employees per aircraft in 1961, 1964, and 1965 shows that substantially larger numbers of employees were utilized to operate jet aircraft. Assuming the average speed and size of PSA's Electras in 1962-64 were roughly comparable to the average speed and size of the trunk carriers' diverse fleet during 1961 (when they produced 50 percent of their total ASM in

jet aircraft, and 14 percent in turboprop aircraft), it appears that PSA utilized about 20 percent fewer employees per aircraft than the trunk carriers, while operating a similar "class" of aircraft.

Overall, it is clear that the number of employees per aircraft is influenced by the size and speed of the aircraft operated. Given this, however, it seems that the intrastate carriers utilized around 25 percent fewer employees per aircraft than the certificated carriers for each class of aircraft. The law of diminishing returns, therefore, would lead one to predict somewhat greater average output per employee for the intrastate carriers. How much greater cannot be determined from these data, but if the differences in output per employee are much greater than the differences in number of employees per aircraft, it may still be reasonable to conclude that there are significant differences in relative labor productivity beyond the effects due to the use of different proportions of labor and nonlabor inputs. The following subsections show that this does seem to be the case.

ASM per Employee

The most general measures of physical output are available ton-miles and revenue ton-miles. Since it has not been possible to obtain such measures for the intrastate carriers, available

RESOURCE UTILIZATION

Table 11-5

Number of Employees per Aircraft Assigned to Service^a
Total Trunk and Local Service Carriers, California Central Airlines
and Pacific Southwest Airlines, Selected Years 1949-1965

Year	Number of Employees per Aircraft Assigned to Service ^a			
	Total			
	Trunk ^b	Local Service	CCA	PSA
1949	77	39	—	—
1950	—	—	25 ^c	—
1951	—	—	—	48
1952	93	41	—	—
1954	—	—	34	—
1955	96	40	—	29
1957	—	—	—	49
1958	98	44	—	—
1959	—	—	—	48
1961	108	41	—	—
1962	—	—	—	96
1963	—	—	—	85
1964	133	42	—	83
1965	143	46	—	85

^aCalculated by dividing average number of aircraft assigned to service into the total number of employees. Employee data are for a brief period of time in each year, while data for the average number of aircraft pertain to the entire year.

^bDomestic operations only.

^cCCA's average number of aircraft assigned to service during 1950 was partially estimated.

RESOURCE UTILIZATION

Table 11-6

Average Annual Available Seat-Miles per Employee^a
Total Trunk and Local Service Carriers, California Central Airlines
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
Selected Years 1950-1965

Year	Average Annual Available Seat-Miles per Employee ^a					
	Trunk ^b		Local Service		California Intrastate	
	Total	Western	Total	Pacific	CCA	PSA
1950	216,000	298,000 ^c	152,000	190,000	184,000 ^d	n.a.
1951	218,000	270,000 ^c	161,000	168,000	n.a.	270,000 ^d
1954	329,000	385,000	182,000	213,000	315,000 ^d	n.a.
1955	341,000	408,000	179,000	220,000	—	499,000 ^d
1957	368,000	410,000	193,000	274,000	—	617,000
1959	389,000	503,000	202,000	254,000	—	743,000
1962	499,000	726,000	257,000	310,000	—	970,000
1963	544,000	781,000	277,000	326,000	—	1,160,000
1964	567,000	774,000	298,000	315,000	—	1,290,000
1965	603,000	769,000	312,000	321,000	—	1,270,000

n.a.—not available.

^aCalculated by dividing total number of employees into annual average scheduled available seat-miles. Employee data are for a brief period of time in each year, while the ASM data pertain to the entire year.

^bDomestic operations only.

^cIncludes Inland Air Lines merged with Western on April 10, 1952.

^dBased on data that are partially estimated.

seat-miles and revenue passenger-miles (RPM) are used here. Unfortunately, these more limited measures penalize the certificated carriers because a much larger portion of their total operations is involved in transporting cargo (freight, express, and mail). To compensate partially for this bias in favor of the intrastate carriers, an added output measure based on total operating revenues will also be used which, because of the differences in fare levels, is biased in favor of the certificated carriers.

It was possible to obtain employment information for only two years for CCA and for just eight years for PSA. CCA employed about 200 persons in both 1950 and 1954, while PSA's range from 1951 through 1965 was 115 to 740 employees. During the same period, the employment for Western (one of the smaller trunk carriers) ranged from 1,288 to 4,328 persons, while Pacific employed between 256 and 814 persons. At no time did PSA's employment equal Pacific's, even though by 1960 PSA's output was much larger than Pacific's.

Table 11-6 presents the average annual ASM per employee for the four carriers and the two certificated carrier groups for the 10 years from 1950 through 1965 for which CCA's or PSA's employment information is available. During these years, the total trunk carriers had much higher outputs per employee than the local service carriers as a group (increasing to almost twice the output

per employee by 1965), whereas Western's outputs per employee were consistently higher than those for total trunk carriers, and Pacific's were higher than those for total local service carriers. Over the 16-year period covered by the data, all of the certificated carriers' ASM per employee increased greatly, doubtless due in large part to the bigger and faster aircraft operated as the years progressed and, for the trunk carriers, to the increasing emphasis on high-density coach service.

The average annual ASM per employee for CCA in 1950 was almost equal to that for Pacific (both carriers operated DC-3's that year), although it was superior to that for total local service carriers. The data for PSA show that even when operating DC-3's in 1951 and 1955, its ASM per employee were far superior to the local service carrier group and to Pacific. In fact, they were even 24 or 46 percent higher than those for the total trunk carriers and either equal to or 22 percent greater than Western's ASM per employee. Then, when it operated four-engine aircraft, PSA's average annual ASM per employee ranged from 34 to 67 percent higher than Western's and from 68 to 128 percent higher than the average for total trunk carriers. Finally, in 1965 PSA still managed to produce 111 percent more ASM per employee than the trunk carriers (and 65 percent more than Western), despite the fact that, whereas 80.6 percent of total trunk ASM were produced

in jet aircraft, PSA did not introduce jets until April 1965 and produced only about a third of its ASM with such aircraft.

RPM per Employee

A similar, but even more striking, difference is found when these carriers are compared on the basis of average annual RPM per employee (see Table 11-7). This measure is influenced by the generally superior load factors attained by the intrastate carriers, and here there is no question about whether CCA was more like a local service carrier or a trunk carrier. In each of the two years for which employment data are available, CCA's average annual RPM per employee was much above that for the total local service carriers and even exceeded that for total trunk carriers by 4 percent. In fact, its figures for these two years were close to Western's relatively high outputs per employee.

PSA's achievements were even more impressive than CCA's. During every year for which information is available, its average annual RPM per employee exceeded that of the total trunk carriers and Western, not to mention the local service carriers and Pacific. In 1951 and 1955, while operating DC-3's (except for the last month and a half of 1955), PSA's outputs per employee were 19 and 60 percent higher, respectively, than Western's. During 1957 and 1959, while operating DC-4's, PSA's outputs per employee were 75 to 124 percent greater than that of both the total trunk

carriers and Western. Then, in 1962-1964, with an all-Electra fleet, PSA retained its 100 percent or more lead over Western while increasing its lead over the trunk carriers to 218 percent, despite the extensive operation of jet aircraft by these carriers. The large increase in PSA's personnel in 1965 (associated with the addition of five B-727-100's to its existing six Electras) resulted in a drop in its output per employee, but its figure was still 87 percent larger than that of Western and 141 percent larger than that of the total trunk carriers.

There is just no question about it. Somehow, some way, PSA managed to achieve impressive levels of RPM per employee. Differences in the order of magnitude of 20 to 30 percent might properly be attributed to inaccuracies or noncomparability in the measures, or to differences in proportions of labor to non-labor inputs. But consistent differences of from 75 to over 200 percent (since 1957) are just too large to be accounted for by these factors, especially when they were achieved while PSA operated DC-4's or Electras and the trunk carriers provided increasing amounts of jet service.

Revenues per Employee

Cargo has accounted for an increasing share of the certificated carriers' output since 1946. By 1965, 19.7 percent of the domestic trunk and 9.9 percent of the local service carriers'

total revenue ton-miles were obtained from cargo. Cargo ton-mile data are not available for the intrastate carriers, but they were prohibited from carrying mail or express, and it is known that they carried little freight during the period under study. It is obvious, therefore, that cargo accounted for a very much smaller share of their total output. It follows that the certificated carriers' total employee figures are relatively larger than those of the intrastate carriers because of the additional employees required to handle cargo traffic. Data are not available that would permit the elimination of cargo employees from the certificated carriers' totals and, even if this adjustment could be made, the jointness of passenger and cargo output would make it impossible to obtain accurate calculations of ASM and RPM per noncargo-related employee. One way to compensate for this bias against the certificated carriers is to calculate average annual total operating revenues (from passenger, cargo, and other operations) per employee as an output measure. Of course, this measure is biased against CCA and PSA because their much lower average fares yield less revenue per unit of physical output. But, taken with the two previous measures, average annual operating revenues per employee should provide some useful insights into comparative airline productivity.

Table 11-8 shows that the average annual operating revenues per employee for CCA and PSA during 1950, 1951, and 1954 were quite

similar to the total revenues (including subsidy) per employee for the total local service carriers. Thus, during those early years, the intrastate carriers were able to obtain roughly the same revenues per employee with their low-fare, high-density coach service as the local service carriers were able to achieve with their high-fare, low-density, first-class service plus subsidies.

By 1955, when it benefited from the termination of rival service by CCA, PSA managed to earn total operating revenues per employee high enough to exceed those for total trunk carriers, total local service carriers, and Pacific, and to approach those for Western. With the adoption of DC-4's, PSA's operating revenues per employee for 1957 and 1959 increased to about 40 percent above those for the total trunk carriers and from 9 to 23 percent above Western's operating revenues per employee. PSA's introduction of Electras in late 1959 was associated with a further relative increase in revenues per employee until they were 98 percent higher than the total trunk carriers' and 55 percent higher than Western's (in 1964). Even in 1965, with a large increase in its number of employees and with its late adoption of jet aircraft, PSA still had a 46 percent advantage over the total trunk carriers and a 25 percent advantage over Western.

RESOURCE UTILIZATION

Table 11-7

Average Annual Revenue Passenger-Miles per Employee^a
Total Trunk and Local Service Carriers, California Central Airlines
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
Selected Years 1950-1965

Year	Average Annual Revenue Passenger-Miles per Employee ^a					
	Trunk ^b		Local Service		California Intrastate	
	Total	Western	Total	Pacific	CCA	PSA
1950	136,000	163,000 ^c	48,000	87,000	142,000	n.a.
1951	152,000	175,000 ^c	60,000	86,000	n.a.	208,000
1954	209,000	214,000	77,000	119,000	218,000 ^d	n.a.
1955	218,000	241,000	81,000	122,000	—	386,000
1957	226,000	246,000	87,000	147,000	—	506,000
1959	239,000	303,000	90,000	136,000	—	529,000
1962	266,000	384,000	109,000	153,000	—	750,000
1963	293,000	422,000	121,000	167,000	—	897,000
1964	314,000	446,000	138,000	169,000	—	998,000
1965	333,000	431,000	147,000	170,000	—	804,000

n.a.—not available.

^aCalculated by dividing total number of employees into annual average scheduled revenue passenger-miles. The employee data are for a brief period of time in each year, while the RPM data pertain to the entire year.

^bDomestic operations only.

^cIncludes Inland Air Lines merged with Western on April 10, 1952.

^dBased on data that are partially estimated.

RESOURCE UTILIZATION

Table 11-8.

Average Annual Operating Revenues per Employee^a
Total Trunk and Local Service Carriers, California Central Airlines
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
Selected Years 1950-1965

Year	Average Annual Operating Revenues per Employee ^a					
	Trunk ^b		Local Service		California Intrastate	
	Total	Western	Total	Pacific	CCA	PSA
1950	\$ 9,100	\$11,000 ^c	\$ 7,000	\$ 8,600	\$ 6,100 ^d	n.a.
1951	9,800	10,700 ^c	7,600	7,800	n.a.	\$ 7,800 ^e
1954	12,600	13,000	9,300	11,800	8,900 ^f	n.a.
1955	12,900	14,600	8,800	11,000	—	13,800
1957	13,100	14,800	9,600	12,600	—	18,200
1959	15,300	19,900	10,700	13,400	—	21,700
1962	18,800	25,700	14,000	16,400	—	31,600
1963	19,700	26,200	14,700	17,300	—	37,600
1964	21,000	26,700	15,700	17,600	—	41,500
1965	22,200	26,100	16,300	18,000	—	32,500

n.a.—not available.

^aCalculated by dividing total number of employees into total domestic operating revenues. The employee data are for a brief period of time in each year, while the total operating revenues pertain to the entire year.

^bDomestic operations only.

^cIncludes Inland Air Lines, merged with Western on April 10, 1952.

^dBased on revenues for the year ended March 31, 1951.

^eBased on an estimate of total operating revenues of \$930,000, calculated by applying average fares for 1951 (Appendix 7) to PSA's on-line O & D passenger traffic (Appendix 14).

^fBased in part on estimated revenues of \$103,000 for January 1-27, 1954.

Summary

Reviewing the percentage differences for all three measures, and recognizing the biases inherent in them, it seems proper to conclude that, while operating two-engine aircraft, the successful intrastate carriers essentially equaled the real output per employee of the total trunk carriers, fell somewhat below that of Western (who was always one of the highest trunk carriers in these measures), and consistently exceeded the output per employee of the total local service carriers and Pacific. Relative output changed radically once PSA obtained four-engine aircraft. From 1957 through 1965, its real output per employee generally exceeded that of the total trunk carriers by more than 100 percent and exceeded that of Western by over 60 percent. It appears that the intrastate carriers utilized about 25 percent less labor per aircraft for generally comparable classes of aircraft and, therefore, should have greater output per employee. But, even if the estimated differences in input proportions are correct, they still do not seem large enough to account for the really impressive differences found in relative outputs per employee. Other factors must account for an appreciable portion of these differences.

It may be argued that the large differences in output per employee were due to the intrastate carriers' purchasing maintenance and sales services from other firms rather than producing them within the company. The best available information for CCA

indicates that its 1950 employee figure did include the maintenance, flight, and administrative personnel officially employed by its affiliated company, Airline Transport Carriers. There is no question, however, about its figure for 1954. The total employees of both CCA and ATC are combined in that figure. In the case of PSA, there is no possibility that total employment was understated because of the outside purchase of maintenance services. PSA consistently did its own maintenance at least as far back as early 1950. If anything, PSA's fuel sale and flight training activities inflate its employment figures and thereby understate the output of ASM and RPM per employee. On the other hand, there are indications that both CCA and PSA relied heavily on travel agents for sales promotion, ticketing, etc. It is not known if their reliance was more extensive than that of the certificated carriers, but it is known from personal observation that during the early 1960's PSA maintained fewer sales offices than the trunk carriers in the three major metropolitan areas of California.

The above data indicate why PSA in particular managed to survive and prosper during the period studied, but they still do not explain why its output per employee was so far superior to that of the certificated carriers. The following is a list of some factors that pertain to this matter, but it is by no means complete:

1. PSA utilized its aircraft more intensively (as described in the previous section), which served to increase its output of ASM and RPM per unit of employee input.
2. PSA operated relatively few aircraft types, thereby reducing employment for crew and maintenance training, engineering, aircraft evaluation, etc. Also, until April 1965, there was only one brief period (in 1960-61) when PSA operated two different aircraft types at the same time (other than during brief transitional periods).
3. PSA's pilots have always been paid for the number of scheduled miles flown, while certificated carrier pilots are paid for the amount of time flown. PSA's pilots, therefore, have a significant monetary incentive to fly as fast as feasible (more miles per hour), which serves to increase output per crew member.
4. Whenever possible, PSA operated its flights under visual flight rules (VFR) rather than under instrument flight rules (IFR). In contrast, the certificated carriers operated all flights under IFR, in accordance with an industry agreement reached through the Air Transport Association. VFR operations serve to reduce flying time for each segment and thereby increase productivity. It should be noted, however, that since the FAA requires

that all jet aircraft operate under IFR, PSA began to lose the advantage of VFR operations as of April 1965.

5. The specialization and resulting simplicity inherent in PSA's route and fare structures served to reduce personnel required to provide a given volume of reservation, ticketing, passenger and baggage handling, and accounting services, etc. These factors also decreased the training required for each employee.
6. The relative lack of regulatory proceedings and industry meetings reduced the need for personnel to conduct such matters, prepare reports, etc. (With the expansion of the PUC's regulatory powers in late 1965, PSA's regulatory activities and associated personnel requirements should be increasing.)

A thorough investigation of the reasons for PSA's greater output per employee is beyond the scope of this chapter. Indeed, it could well provide the basis for another major study. The crucial point to be made here is simply that the successful intra-state carriers were able to produce relatively more output per employee than the certificated carriers. In addition, as shown in the previous section, they also utilized their aircraft resources more intensively. The overall result of these and other unidentified factors was important differences in efficiency

between these carrier groups.

The intrastate carriers' utilization of resources appears to have been substantially more effective than that of the certificated carriers. They demonstrated that it is feasible to achieve more intensive utilization of aircraft than has been attained by the trunk carriers, mainly by installing more seats in coach aircraft (and essentially ignoring low-density, first-class configurations) and by managing to fill a greater proportion of those seats with paying passengers. In addition, they increased the productivity of certain piston-powered aircraft by operating them after they were discarded by the certificated carriers. The intrastate carriers also demonstrated that it is possible to achieve substantially greater output per employee than that of the trunk (and local service) carriers. The ways that the intrastate carriers used to obtain relatively greater productivity appear to be manifold, and substantial changes in certificated carrier operations would be required for them to attain similar productivity. These changes would include major revisions in the route structures of the certificated carriers to give them simple structures similar to those of the intrastate carriers. (Implicit in this would be a higher degree of specialization by each one of a greater number of carriers.) In addition, the rate of adoption of new aircraft types would be decreased, schedule patterns would be established to correspond more closely to

predictable fluctuations in demand, methods of employee compensation changed, different aircraft operating procedures adopted, fewer classes of service offered, a reduction in the amount of regulatory and industry activities undertaken, etc. Increases in real output per employee of over 100 percent are difficult to comprehend, but the evidence provided by PSA's operations indicate they could be achieved, at least in markets comparable to the major California markets, and, if market characteristics are a relevant factor, even greater increases in average employee output could be realized by carriers specializing in serving the major transcontinental markets.

From the viewpoint of this study, a relevant question is: Did the more intensive utilization of aircraft and the relatively greater output per employee by the intrastate carriers stem in whole or in part from the less stringent regulation under which they operated until late 1965? The evidence at hand does not provide a categorical answer to this question. The more intensive aircraft utilization and greater output per employee, however, are consistent with the significantly lower per-mile fares that the intrastate carriers charged. Given these lower fares, it was crucially important for the intrastate carriers to minimize the costs of their operations in order to survive. Obvious ways to decrease average costs per passenger would be to increase the number of seats in each aircraft and to schedule aircraft so that

a greater proportion of these seats were occupied. Another way would be to utilize labor inputs so that greater ASM, RPM, and revenues were obtained for each employee. These were actions that the intrastate carriers took, or, at least, that the viable intrastate carriers managed to take. Since the differences in passenger fares can be attributed more directly to differences in regulation, and since lower costs are required for survival under lower fares, the evidence on aircraft utilization and output per employee is consistent with the hypothesis that regulation, as practiced by the CAB, does have an adverse affect on efficiency in air transportation.

Conclusions

The evidence from the California intrastate carriers' experience seems to indicate that:

1. Nonregulated airlines can survive and provide reliable service with fares 30 to 50 percent less than those set by certified carriers under CAB control.
2. Although all nonregulated have not been successful, those that have survived have made profits with low fares. In particular, PSA's operating ratios and return on stockholder equity have been outstanding.
3. The surviving nonregulated airlines utilize their capital (aircraft) and labor inputs more efficiently

then do the CAB certificated carriers.

4. The physical operations of airlines are not characterized by significant economies of scale. Over a suitable route structure, 4 to 6 aircraft will yield minimum longrun average costs.

Table 10-1

Selected Financial Data, Operating Ratio, and Return on Stockholder Equity
Pacific Southwest Airlines, Various Years 1950-1965

Year	Total Operating		Profit after Taxes ^a	Stockholder Equity ^b	Operating Ratio ^c	Return on Stockholder Equity ^d
	Revenues	Expenses				
1950	\$ 505,988	\$ 489,939	n.a.	n.a.	96.8%	n.a.
1955	1,587,697	1,523,385	\$ 243,997 ^e	n.a.	95.9	n.a.
1956	2,264,850	2,144,385	58,588	n.a.	94.7	n.a.
1957	3,126,254	2,727,079	196,606	\$ 86,550	87.2	227.2%
1958	3,929,921	3,267,309	322,031	n.a.	83.1	n.a.
1959	4,775,993	3,867,215	455,901	1,057,609	81.0	43.1
1960	8,130,483	8,109,688	499	n.a.	99.7	0.0
1961	10,300,293	9,173,116	310,483	n.a.	89.1	n.a.
1962	14,204,915	10,803,179 ^f	1,368,770	3,007,734	76.1	45.5
1963	17,852,448	12,900,409 ^f	2,251,719	7,429,810	72.3	30.3
1964	20,773,372	14,827,433	2,945,881 ^g	10,075,046	71.4	29.2 ^g
1965	24,015,261	19,605,184	2,034,932 ^g	11,504,770	81.6	17.7 ^g

n.a.—not available.

^aProfit after taxes and special items.

^bAs of December 31, of each year.

^cTotal operating expenses divided by total operating revenues.

^dProfit after taxes and special items divided by stockholder equity.

^eIncludes gain of \$206,150 on sale of DC-3 aircraft. Excluding this gain yields profit after taxes for 1955 of \$37,847.

^fReported total operating expenses reduced by \$100,000 (1962) and \$55,000 (1963) by deletion of investment tax credit that was added to provision for obsolescence and depreciation during those years.

^gIncludes provisions for investment tax credit.

AIRLINE REGULATION IN AMERICA

Table 10-2

Operating Ratios for Total Trunk and Local Service Carriers
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
1949-1965

Year	Operating Ratio ^a				
	Trunk Carriers ^b		Local Service Carriers		PSA
	Total	Western	Total	Pacific	
1949	94.6%	92.2%	102.1%	94.4%	n.a.
1950	88.1	88.7	97.8	88.2	96.8%
1951	83.9	83.4	97.9	98.4	n.a.
1952	87.6	83.8	102.6	95.0	n.a.
1953	89.9	88.7	103.1	104.0	n.a.
1954	89.8	92.3	97.1	92.2	n.a.
1955	89.2	85.9	98.8	96.0	95.9
1956	92.0	90.8	100.9	103.1	94.7
1957	97.0	88.1	100.9	100.9	87.2
1958	93.7	95.9	98.3	103.4	83.1
1959	94.1	81.5	99.5	97.5	81.0
1960	98.2	90.9	98.5	102.8	99.7
1961	100.5	97.6	94.7	91.6	89.1
1962	96.7	90.6	93.5	93.8	76.1
1963	94.7	81.5	94.7	95.0	72.3
1964	89.4	78.4	93.3	90.2	71.4
1965	87.2	82.4	91.7	90.0	81.6
Median	92.0	88.7	98.3	95.0	85.2 ^c
Range	83.9-100.5	78.4-97.6	91.7-103.1	88.2-104.0	71.4-99.7*

n.a.—not available.

*Estimated.

^aTotal operating expenses divided by total operating revenues.

^bDomestic operations only.

^cBased on data for 12 years rather than 17 years.

AIRLINE REGULATION IN AMERICA

Table 10-3

Return on Stockholder Equity for Total Trunk and Local Service Carriers
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
1951-1965

Year	Return on Stockholder Equity ^a				
	Trunk Carriers ^b		Local Service Carriers		PSA
	Total	Western	Total	Pacific	
1951	17.9%	17.5%	13.5%	6.6%	n.a.
1952	18.5	15.0	-1.9	10.3	n.a.
1953	14.0	8.3	-6.3	-7.5	n.a.
1954	13.9	14.4	14.2	10.3	n.a.
1955	14.8	17.0	7.5	18.9	n.a.
1956	11.9	22.5	-4.4	-6.6	n.a.
1957	4.8	15.5	-11.4	2.1	227.2%
1958	7.7	9.2	10.7	-7.2	n.a.
1959	9.6	24.8	0.5	23.6	43.1
1960	0.0	8.5	14.8	-10.9	0.0
1961	-5.2	2.2	21.2	15.2	n.a.
1962 ^c	1.2	11.7	19.2	6.1	45.5
1963 ^c	1.9	21.6	13.0	-0.9	30.3
1964 ^c	17.1	25.5	16.3	26.4	29.2
1965 ^c	21.6	19.6	19.3	14.2	17.7
Median	11.9	15.5	13.0	6.6	n.a.
Range	(-)-5.2-21.6	2.2-25.5	(-)-11.4-21.2	(-)-10.9-26.4	0.0*-227.2*

n.a.—not available.

*Estimated.

^aProfit after taxes and special items divided by stockholder equity. The certificated carriers' return is based on the arithmetic mean of stockholder equity at the end of the 12-month period a year ago and at the end of each quarter of the current 12-month period. PSA's return is based on stockholder equity as of December 31, of each year.

^bDomestic operations only.

^cIncludes provisions for investment tax credit.

AIRLINE REGULATION IN AMERICA

Table 11-1

Average Number of Revenue Hours per Aircraft per Day
Certificated and California Intrastate Carriers
All Services, Selected Years 1952-1964

Year	Average Number of Revenue Hours per Aircraft per Day ^a						
	Total Certificated		California Intrastate				
	Trunk	Local Service	CCA	CTA	Mercer	PSA	TCA
1952	7.3	6.0 ^b	5.4	—	—	8.0	—
1955	7.7 ^c	6.0	n.a.	—	—	7.3	—
1958	7.5	6.5	—	—	—	6.6	—
1961	5.9	5.4	—	—	—	7.0	—
1964	6.5	5.5	—	1.8 ^d	0.8 ^e	8.7	2.1 ^f

n.a.—not available.

^aCalculated by dividing the number of aircraft days assigned to service into revenue aircraft hours flown.

^bScheduled service only.

^cExcludes a small number of hours flown by Eastern with aircraft not assigned to its fleet. Also, excludes National's helicopter operation.

^dCalifornia Time Airlines operated from September 19, 1964, through February 1, 1965. This figure applies to this entire period.

^eMercer Enterprises inaugurated scheduled service on or about April 18, 1964. This figure applies to its first full 12 months of operation from May 1964 through April 1965.

^fTrans California Airlines terminated service on October 7, 1964. This figure applies to its operation from January 1 through October 7, 1964.

RESOURCE UTILIZATION

Table 11-2

Coach Seating Configurations for Aircraft Operated within California
by Both the Certificated and the California Intrastate Carriers
1949-1965

Aircraft Type	Certificated		California Intrastate		Intrastate % of Certificated
	Carrier	No. of Seats	Carrier	No. of Seats	
DC-3	United	— ^a	CCA	28 & 32	—
	Western	— ^a	PSA	28 & 31	
	Pacific	— ^a	Others	28	
M-202	Pacific	40	CCA	44	110%
DC-4	TWA	62	CCA	60	97-111
	United	64 & 66	PSA	62 & 70	
	Western	66	Others	73	
L-049	TWA	80 & 81	Futura	81	100-101
			Paradise	81	
L-749	TWA	— ^b	TCA	98	—
DC-6B	United	79	PSA	98	103-124
	Western	87, 92, 95			
Electra	Western	94 & 96	PSA	98	102-104
B-727	United	113	PSA	122	108

^aThe certificated carriers did not operate their DC-3's in coach configuration within California. United and Western installed 21 first-class seats in their DC-3's, while Pacific installed 28 such seats.

^bTWA did not operate its L-749's in coach configuration within California. Its maximum first-class seating configuration for L-749's was 55 seats.

AIRLINE REGULATION IN AMERICA

Table 11-3

Average Annual Passenger Load Factors
for the Certificated and California Intrastate Carriers
Scheduled Service, 1946-1965

Year	Passenger Load Factor (Percent)			
	Certificated Trunk		Total Cert. Local Service ^a	Total Intrastate ^b
	First Class	Coach		
1946	78.8%	—	37.9%	n.a.
1947	65.7	—	29.8	n.a.
1948	58.5	72.9% ^c	27.1	—
1949	58.7	70.2	28.2	66.9
1950	61.2	74.2	31.5	73.9
1951	68.9	74.5	37.4	69.0
1952	65.3	75.6	37.5	65.9
1953	62.2	72.8	38.6	67.1
1954	61.2	68.2	42.2	69.2
1955	62.3	67.6	45.2	72.2
1956	62.4	67.3	45.8	75.7
1957	59.4	65.1	45.2	80.6
1958	58.9	61.7	45.7	72.4
1959	59.5	64.1	44.4	71.1
1960	56.1	63.3	41.9	71.1
1961	51.6	60.2	41.6	72.1
1962	46.6	57.6	42.3	75.3
1963	51.7	54.9	43.8	72.8
1964	49.9	57.8	46.4	74.9
1965	49.0	57.7	47.3	63.3

n.a.—not available.

^aSome local service carriers operated small amounts of coach service in 1952-53 and from 1956 to early 1965. Their coach load factors were generally above their first-class load factors and, overall, equaled 51.3 percent. However, due to the limited quantity of coach service, the total local service load factor was no more than 0.3 percentage points above the first-class load factor in any one year.

^bPartially estimated, includes all services.

^cCoach service inaugurated November 4, 1948.

RESOURCE UTILIZATION

Table 11-4

Percentage of Total Weekly Seats Scheduled on Friday and Sunday^a
in the Three Major California Markets
by the Certificated and the California Intrastate Carriers
Selected Dates 1948-1965

Date	Percent of Total Weekly Seats Scheduled on Friday and Sunday ^a								
	LAX/BUR-SFO/OAK ^b			LAX/BUR/LGB/ONT-SAN			SAN-SFO/OAK/SJC		
	Certificated		Intra- state	Certificated		Intra- state	Certificated		Intra- state
	First	Coach		First	Coach		First	Coach	
8/ 1/48	28.7%	—	—	28.6%	—	—	28.6%	—	—
7/31/49	28.4	—	30.3%	24.4	—	29.6%	28.6	—	29.6%
3/ 1/51	28.7	30.8%	35.8	29.4	—	27.7	29.1	—	28.4
9/ 1/52	28.4	28.6	37.4	28.6	28.6%	29.7	28.6	28.6%	34.0
9/ 1/53	28.7	28.6	39.2	28.6	28.6	31.6	28.6	28.6	35.0
12/ 1/54	28.6	28.6	39.2	28.2	28.6	29.6	27.1	28.6	32.8
8/ 1/55	29.1	30.1	35.2	28.6	28.6	28.3	27.6	28.6	32.1
8/ 1/56	29.1	30.0	35.8	28.6	28.6	20.0	28.6	28.6	29.4
8/ 1/57	28.3	30.3	42.4	27.9	28.6	28.1	29.7	28.6	35.9
8/ 1/58	29.2	28.5	44.7	28.2	28.8	31.7	29.1	28.6	37.9
8/ 1/59	29.1	28.2	31.1	28.3	28.8	29.7	27.1	29.1	35.0
8/ 1/60	28.7	28.2	38.6	28.6	28.8	24.4	29.9	29.6	31.1
8/ 1/61	28.9	28.6	38.3	27.5	29.2	23.7	28.6	28.4	28.1
8/ 1/62	28.4	28.5	36.1	28.6	28.8	24.6	28.6	27.8	29.2
8/ 1/63	28.0	28.5	35.0	28.2	29.3	29.3	23.1	23.1	33.1
8/ 1/64	28.2	28.6	33.1	28.5	28.6	23.1	—	26.9	28.6
10/ 1/64	28.5	29.0	33.1	28.6	28.8	23.1	—	26.9	28.6
8/ 1/65	29.2	29.6	33.1	28.1	28.2	25.8	—	28.2	31.2
Median	28.7	28.6	35.8	28.6	28.6	28.1	28.6	28.6	31.2
Range	28.0- 29.2	28.2- 30.8	30.3- 44.7	27.5- 29.4	28.2- 29.3	20.0- 31.7	23.1- 29.9	23.1- 29.6	25.1- 37.9

^aFlights scheduled to depart up to 2:30 A.M. on Saturday or Monday were considered to have been Friday or Sunday flights.

^bLAX/BUR/LGB/ONT-SFO/OAK/SJC.

RESOURCE UTILIZATION

Table 11-5

Number of Employees per Aircraft Assigned to Service^a
Total Trunk and Local Service Carriers, California Central Airlines
and Pacific Southwest Airlines, Selected Years 1949-1965

Year	Number of Employees per Aircraft Assigned to Service ^a			
	Total	Trunk ^b	Local Service	
1949	77	39	—	—
1950	—	—	—	25 ^c
1951	—	—	—	—
1952	93	41	—	48
1954	—	—	—	—
1955	96	40	—	29
1957	—	—	—	49
1958	98	44	—	—
1959	—	—	—	48
1961	108	41	—	—
1962	—	—	—	96
1963	—	—	—	85
1964	133	42	—	83
1965	143	46	—	85

^aCalculated by dividing average number of aircraft assigned to service into the total number of employees. Employee data are for a brief period of time in each year, while data for the average number of aircraft pertain to the entire year.

^bDomestic operations only.

^cCCA's average number of aircraft assigned to service during 1950 was partially estimated.

RESOURCE UTILIZATION

Table 11-6

Average Annual Available Seat-Miles per Employee^a
Total Trunk and Local Service Carriers, California Central Airlines
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
Selected Years 1950-1965

Year	Average Annual Available Seat-Miles per Employee ^a					
	Trunk ^b		Local Service		California Intrastate	
	Total	Western	Total	Pacific	CCA	PSA
1950	216,000	298,000 ^c	152,000	190,000	184,000 ^d	n.a.
1951	218,000	270,000 ^c	161,000	168,000	n.a.	270,000 ^d
1954	329,000	385,000	182,000	213,000	315,000 ^d	n.a.
1955	341,000	408,000	179,000	220,000	—	499,000 ^d
1957	368,000	410,000	193,000	274,000	—	617,000
1959	389,000	503,000	202,000	254,000	—	743,000
1962	499,000	726,000	257,000	310,000	—	970,000
1963	544,000	781,000	277,000	326,000	—	1,160,000
1964	567,000	774,000	298,000	315,000	—	1,290,000
1965	603,000	769,000	312,000	321,000	—	1,270,000

n.a.—not available.

^aCalculated by dividing total number of employees into annual average scheduled available seat-miles. Employee data are for a brief period of time in each year, while the ASM data pertain to the entire year.

^bDomestic operations only.

^cIncludes Inland Air Lines merged with Western on April 10, 1952.

^dBased on data that are partially estimated.

RESOURCE UTILIZATION

Table 11-7

Average Annual Revenue Passenger-Miles per Employee^a
Total Trunk and Local Service Carriers, California Central Airlines
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
Selected Years 1950-1965

Year	Average Annual Revenue Passenger-Miles per Employee ^a					
	Trunk ^b		Local Service		California Intrastate	
	Total	Western	Total	Pacific	CCA	PSA
1950	136,000	163,000 ^c	48,000	87,000	142,000	n.a.
1951	152,000	175,000 ^c	60,000	86,000	n.a.	208,000
1954	209,000	214,000	77,000	119,000	218,000 ^d	n.a.
1955	218,000	241,000	81,000	122,000	—	386,000
1957	226,000	246,000	87,000	147,000	—	506,000
1959	239,000	303,000	90,000	136,000	—	529,000
1962	266,000	384,000	109,000	153,000	—	750,000
1963	293,000	422,000	121,000	167,000	—	897,000
1964	314,000	446,000	138,000	169,000	—	998,000
1965	333,000	431,000	147,000	170,000	—	804,000

n.a.—not available.

^aCalculated by dividing total number of employees into annual average scheduled revenue passenger-miles. The employee data are for a brief period of time in each year, while the RPM data pertain to the entire year.

^bDomestic operations only.

^cIncludes Inland Air Lines merged with Western on April 10, 1952.

^dBased on data that are partially estimated.

RESOURCE UTILIZATION

Table 11-8

Average Annual Operating Revenues per Employee^a
Total Trunk and Local Service Carriers, California Central Airlines
Western Air Lines, Pacific Air Lines, and Pacific Southwest Airlines
Selected Years 1950-1965

Year	Average Annual Operating Revenues per Employee ^a					
	Trunk ^b		Local Service		California Intrastate	
	Total	Western	Total	Pacific	CCA	PSA
1950	\$ 9,100	\$11,000 ^c	\$ 7,000	\$ 8,600	\$ 6,100 ^d	n.a.
1951	9,800	10,700 ^c	7,600	7,800	n.a.	\$ 7,800 ^e
1954	12,600	13,000	9,300	11,800	8,900 ^f	n.a.
1955	12,900	14,600	8,800	11,000	—	13,800
1957	13,100	14,800	9,600	12,600	—	18,200
1959	15,300	19,900	10,700	13,400	—	21,700
1962	18,800	25,700	14,000	16,400	—	21,600
1963	19,700	26,200	14,700	17,300	—	37,600
1964	21,000	26,700	15,700	17,600	—	41,500
1965	22,200	26,100	16,300	18,000	—	32,500

n.a.—not available.

^aCalculated by dividing total number of employees into total domestic operating revenues. The employee data are for a brief period of time in each year, while the total operating revenues pertain to the entire year.

^bDomestic operations only.

^cIncludes Inland Air Lines, merged with Western on April 10, 1952.

^dBased on revenues for the year ended March 31, 1951.

^eBased on an estimate of total operating revenues of \$930,000, calculated by applying average fares for 1951 (Appendix 7) to PSA's on-line O & D passenger traffic (Appendix 14).

^fBased in part on estimated revenues of \$103,000 for January 1-27, 1954.

N73-32893

Charles D. Baker
President
Harbridge House, Inc.

July 21, 1972

FEDERAL REGULATORY TRENDS
AND THE
EMERGING PROFILES OF AIR TRANSPORTATION

Since my colleagues, James C. Miller and Paul W. Cherington, have already told you more than you ever wanted to know about regulation of the air transportation industry, I will take it a step further and discuss the groups having the greatest impact on the future of air transportation. In commenting on those groups, I will examine their aims and objectives and how they will affect the greater glories we have all been led to expect.

In looking at my chosen topic, "Federal Regulatory Trends and the Emerging Profiles of Air Transportation," substitute "government agency interests" for "regulatory trends" and read "carriers and investors" where it says "air transportation." On the assumption that there is some kind of market (hard to dispute), it is these two major groups that determine what air transportation will look like. To be sure, the technologist and metal bender warrant attention since they helped develop air transportation that is safe, fast, comfortable, clean, silent, nonland-using, efficient, available, and reliable. But they function in large measure at the behest of the two major groups. (So much for the Harvard man's view of M. I. T.)

Having defined the two broad groups of concern, let me now turn to the general health of the industry. Growth is impossible without the very important capital inflow ingredient. But this means that profits are a critical element. By the end of 1970 the scheduled air carriers produced an aggregate loss of \$150 million to \$200 million. Unbelievable and unheard of in the history of the industry. As what has been the general response of the (financial) marketplace to the airlines from, say, 1965 to the present? Well, you get stock price curves that have a long term decline; there are nice bumps here and there, but the general stock price trend is adverse.

So let me offer a first finding; the financial markets are looking with increasing disdain on air carriers. Now to be sure there are other important elements in gauging the health of the industry: technological advances, fare reduction, safety (let's not kill people), and service and availability of aircraft. But if we agree that growth requires new capital, let's face the reality that there may be more attractive girls around (to would-be investors) than the airlines.

O.K., so much for a quick financial snapshot, let's look at carrier management. What do we know about the management of air carriers? From 1946 to 1966 the emphasis was on production. The market demand for air transportation was growing at a steady rate, and the carriers were fighting to keep up with it, while at the same time struggling with the problems of production, costs, service, and so forth. The classic factory problem! And scheduled air transportation has a dramatically successful track record in solving these problems. Prices to users have declined, quality of service has increased dramatically, and all told the safety record is admirable. In short, the production men in aviation delivered just like the production men in Detroit proved they could really respond to the requirement to produce. But like Studebaker, Packard, Pierce Arrow, Kaiser-Fraser (not to mention the Tucker Torpedo) production alone eventually proves to be not enough. Since 1966 managers have moved out of the production orientation and turned their attention to various problem areas like profits (Don Nyrop) and just day-to-day survival--keeping their respective carriers afloat. The airlines can all boast of being safe, clean, reliable, low cost, but unfortunately not profitable. That's the current predicament. Query? Do the airlines now have the kind of different managers needed in the 70's and 80's?

Airline managers have made several proposals recently vis-a-vis government regulation, the most common one requesting some measure of price competition, (price flexibility). Interestingly enough, in the same gasp they discuss constraint of capacity competition. Although today there is little competition, air carriers are competing in the form of capacity (frequency of service, etc.)

Perhaps this arrangement will be exchanged for a limited allowance of price competition and regulation or common agreements among airlines on capacity. How does this grab you? Does this sound like the voice of an airborne Alfred P. Sloan (1972 version)? or more like J.P. Morgan (1911 version)?

We talked earlier a bit about how the financial market seems to look at this industry. Let's get back to this area for a minute. Just at the time when the public is increasing its demands on the airlines, particularly in the area of environmental protection, the investment community is going sour on the industry. And the need for new cash gets more acute as traffic demands swing up again from the 1970 debacle. As an example of what the capital market thinks of air transportation, it's interesting to note that, according to the New York Stock Exchange, Avon Products is worth more than the combined values of 11 trunk carriers and Pan Am.

Now, investors fall into various categories with rather different objectives. Personally, I think that like lawyers, most of them should be shot. However, they exist and we must live with them. Commercial bankers are the most conservative, loaning money only when they think they can get their money back--a practice that has held them in good stead. In dealing with the airline industry recently they have restricted their offering to a bewildering array of notes. Investment bankers and the funds are a little different crowd, concentrating on the short term appreciation of an investment. Another source of capital which has only emerged within the last decade is the equipment leasing group, composed principally of insurance companies. This remains a stable source of capital, while the previously mentioned sources are in some jeopardy.

So much for high finance. Where is old Uncle Sam? or more specifically, what might the government do to improve significantly the prospects for air transportation? Below is a laundry list of ideas I have heard voiced over the years by various people in Washington.

- Clobber competition (other modes of transportation, such as buses). Note that railroads are already dead.
- Provide good traffic. ("Fly American!")

- Provide cash for the support activities (e.g. airports).
- Moderate competition.
- Guarantee loans, for equipment leasing as an example.
- Relieve uncertainties by making such agencies as CAB move.
- Clock labor.
- Assume the perspective of the carrier, not the shipper or the traveler.
- Offer direct subsidy.
- Lessen regulation.
- Open up competition.
- Provide R&D support.

This list is just a brief sketch of things that might be done. I'm sure you could add many other possibilities which might help or hurt. Question - what's likely to occur? As a start, let's recognize the confusion in directions, desires, and goals of the various government agencies. Let's take a quick run through some of these agencies and note how they influence the air transportation industry-- we'll concentrate on the federal government just to "simplify" things.

Civil Aeronautics Board. In looking at the CAB over the past decade, I am bewildered as to what its goals and objectives really are. Generally speaking it seems to favor growth of the system, addition of service, but a competitive status quo. However, it has not been able psychologically or politically to support real efficiency in the system. Good new routes often go to bummers, to preserve some mythical competitive balance, which raises some hard questions. Do we want to try and make this system very efficient; do we want to have more people on the airplanes; do we want to get rid of things like cross subsidy; do we want to reward the successful carrier with more routes or do we want to go through the absurdity of saying we will award the Miami/L. A. route to the carrier barely able to stay afloat?

Department of Transportation. FAA has for a number of years been expanding to provide an adequate support system and doing a fairly good job of it. Growth and safety are their aims. Air carrier efficiency? Who knows?

The DOT policy office (TPI) is the only other part of DOT really concerned with the aviation industry, and it is still too new to define precisely its role and direction, although it seems to lean towards becoming an alter ego to the CAB.

Department of Defense. DOD actually impels a good deal of traffic. It operates a very big, slick, nationalized air system which is probably not very economical. What are its objectives? After scrubbing it all away, I think you could say that their objectives are two. One, a large scale organic in-house lift capability which means no good for commercial air transportation. Two, the lowest prices they can get when they use commercial systems. I don't submit, incidentally, that any of that is necessarily wrong in terms of DOD's responsibilities.

Department of State. In the main it seems fair to say that State has supported our national flag carriers.

Department of the Treasury. Treasury is concerned with keeping the debt down, watching the budget, and avoiding any long term commitments.

Health, Education, and Welfare. The environmental people within HEW wish the smoke was whiter and the planes were less noisy. That's about the level of their expertise.

Department of Labor. The position of Labor is quite simple--get the government out of the negotiation business.

Department of Justice. The Office of the Assistant Attorney General for Antitrust has been very consistent in its policy without regard to which industry is involved. A lot of competition is good, and more competition is even better.

The White House. The incumbents are pushing for more free enterprise and are efficiency oriented.

Council of Economic Advisors. Their position is somewhat analogous to the aforementioned White House philosophy.

Office of Management and Budgets. If there is a large deficit budget looming on the horizon, we will see the general route strengthening proposals in local air service come straight out of OMB. In short, Budget offices always rise above principal when principal is involved.

NASA. NASA consistently exhibits a desire to advance technology.

"If we develop it, a use will be found!"

The Post Office. The postal service is concerned with the lowest cost to them. What does this mean? Well, what it certainly does not mean is a series of government agencies locked in phalanx marching towards a glorious aviation horizon. On the contrary, it adds up to a variety of (properly) conflicting aims and pressures. And those of us who favor aviation had best realistically grasp this fact.

In the foregoing remarks I've touched briefly on the financial markets, the carriers and the government. Does this all add up to any useful findings? On balance, I think so. Let me sum them up.

- Air transportation demand is good and growing, but
- The industry has real problems to tackle--congestion, pollution (real or imagined), noise/land use, and capital needs, and unfortunately
- Technological support is waning from its main historical source (DOD),
- Carrier earnings are on a long term slide, and capital markets are thinning out, while
- The views of government agencies are widely disparate.

In line with the above, I'll suggest several areas where changes are needed--

- Policy leadership in government. Perhaps DOT's policy office is now well enough equipped to handle this role. (TPI maybe an ugly broad, but in this context she's probably the only girl in town).
- Government dollars explicitly marked for R&D.
- Some revision in approaches to regulation. Old line regulation and production-minded management (complete with glass helmets and goggles) won't cut it in 1976.

Ladies and gentlemen, this is a jewel industry. It's fun and socially useful. But let us not be beguiled by pleasant surroundings and self congratulatory speeches. Let's face the real world around us and then get on with the job.

N73-32894

The Future of Regulation in the Airline Industry

Remarks of Paul W. Cherington, James J. Hill Professor of Transportation
Harvard Business School and Chairman of the Board,
Temple, Barker & Sloane, Inc. at the NASA/MIT Aviation Workshop,
Waterville Valley, New Hampshire

July 21, 1972

The six propositions which this paper addresses can be summarized
as follows:

1. Despite efforts toward deregulation, regulation of the airline industry is alive and well and can look forward to many more years of growth. In short, regulatory powers will expand rather than contract.
2. In part, regulation will expand because, when all is said and done, the airlines like it (or at least prefer it to market competition.) So do their lawyers and consultants.
3. In part, this is true because the market competition model put forward by many economists is neither very realistic in terms of the real world nor does it take into account many socio/political facts of life.
4. The market competition model, aimed primarily at an optimum allocation of resources, is neither particularly good nor bad but simply irrelevant in a society where the economic allocation of resources is of much less concern than formerly. Economists, in many ways, are like someone who is trying to improve the buggy-whip industry. It is no doubt fun; the models are no doubt elegant; but the results are largely beside the point since no one wants buggy whips anymore.
5. We would do much better to try to develop a new strategy for regulation so that the CAB can grow into a constructive force for the development of civil aviation, rather than being the somewhat benign nuisance that it is today, or deteriorating, as has the ICC, into a rather drab and unattractive home for the disoriented.

6. The elements of a new regulatory strategy would be first, to provide for the testing and introduction of new ideas and new services, aimed at new markets, much more promptly and effectively than today with far less attention to the creation of monopolistic competition for existing markets and services. Second, it would involve more responsive handling of industry and company crises on an administrative level, to clear these out of the way, and finally it would be focused on the attraction of new capital to the industry so that the interface of aviation economics with aviation technology can be fully exploited.

Before returning to a discussion of these six propositions, let me acknowledge that some of what I will have to say is based upon a study which Temple, Barker & Sloane, Inc. recently completed for Dr. Mundo of the Systems Analysis Office at the Transportation Systems Center. The study has not yet been released so that I will not quote from it or give its conclusions, beyond saying that it dealt with the impact of regulation on the growth in demand for air transportation. The interesting thing about our findings was to the effect that in the past regulation really hadn't mattered very much so far as growth was concerned, except to the extent that growth was influenced by the structure of the industry. Regulation had clearly influenced industry structure.

Returning now to the six propositions.

Proposition No. 1 - CAB powers will continue to expand. Deregulation is not in the cards. This is a good bet for almost any bureaucratic institution. It is almost a certainty for airline regulation. The only thing that might happen to CAB is that some of its powers might get transferred or usurped by DOT. But the total bundle of Government economic regulatory powers will not diminish. Unless CAB starts misbehaving (that is, becoming too effective) I would bet against any significant shift in power between CAB and DOT. That agency has not built up with the industry the kind of indebtedness which the airlines have to the CAB. Its attention is divided between several modes so that airlines can never be sure that they are not going to get "Northeast Corridorized." In short, DOT is an inter-modally balanced organization and that is not what aviation enthusiasts want.

Thus we have the CAB acquiring control over maximum and minimum international fares in 1972. No doubt other powers will gradually be added in the future.

It is safe to conclude that CAB is here to stay and that its powers will enlarge, not diminish. I am convinced of this by looking at the survivability of the ICC. Even when the majority leader in the Senate proposed the complete elimination of that agency (admittedly in a fit of pique), the ICC went right on cutting out its paper dolls, studying the tariff on Yak fat, pondering whether it was all right to abandon the rail line from Overshoe to East Overshoe (even though the trees were so large that no diesel could get through) meanwhile enjoying the spectacle of 60% of the eastern railroads slipping into bankruptcy. If an agency like that can survive (and get larger appropriations and have the chutzpah to ask for more powers), the CAB will surely flourish.

Proposition No. 2 - A second reason for believing that regulation will continue and will probably expand lies in the fact that it is what the industry secretly wants, or dislikes least. Certainly their lawyers and consultants are happy with things just the way they are and wouldn't enjoy deregulation at all.

No new upstart airlines are admitted to the club. If let in at all, they are only given permission to sit in the "strangers room" for a temporary period. The Board's procedures are well known and predictable even if its decisions often are not. Procedural order has much to recommend it as against the rough and tumble of an openly competitive brawl. The Board moves in the price area from time to time, but the main initiative on pricing is left up to the carriers. The Board does not give the carriers all that they ask for in the way of fare increases but as regulatory bodies go, it has been surprisingly benign in the fare area.

But there is more to it than the law of the survival of bureaucracies and the fears of the regulated. This leads to Proposition No. 3. The CAB will in part survive because the economists have not given us any attractive or realistic alternative to traditional regulation. The market competition model that they urge upon us is not of this world, and it ignores a large number of socio/political objectives that are very real.

The model says that there ought to be largely unfettered entry and exit, the ability to focus on markets where the demand is large and ignore those where demand is small. Also the model calls for vigorous price (not service) competition. Professor Jordan in his recent book makes a meticulously researched case for this approach based on the intra-California experience. I admire his craftsmanship and almost completely disagree with his conclusions. But whether we agree or disagree with the market competition model, the fact is that it is not very useful in today's world. For example, it ignores politics. We can all think of instances where politics have over-ridden economics. The important thing is not that this happens, but that no model which does not accommodate socio/political objectives will be accepted as a guide for policy-making. For example, political pressures are going to require a certain amount of cross-subsidization, a real "no-no" under the market competition model. Some people are going to have to serve East Overshoe. Ideally they can get directly subsidized for doing so. But mostly they can't. And when they can't, their good routes will have to supply the subsidy. If there are no "good" routes, there can be no cross-subsidization and no service in East Overshoe. Under open competition, there are no "good" routes.

The analysis used in defending the competitive model lays considerable stress on the fact that there appear to be few short-term operational economies of scale. Small companies can apparently compete with large ones on cost. I am not sure this has been entirely proven, but that is the way the numbers seem to run. But small companies almost certainly cannot compete with larger ones in terms of new equipment, and it is new equipment that explains much of the dynamism of air transportation. A B-747 is perhaps ahead of its time, but the industry would simply not exist as we know it today if it were still operating the DC-3, the DC-4, or the L-649. Greater productivity (and the greater passenger appeal) of new equipment has kept the industry moving forward, and no band of gypsy operators can provide that kind of forward impetus.

If the competitive model can be enlarged to include some of these facts of the real world, perhaps it can be "sold" for public policy use. As it is today, it is neither used or useful, except in the Alice-in-Wonderland nightmare of anti-trust.

Proposition No. 4 - The market competition model is essentially addressed to an optimum allocation of resources. As our resources have increased, this objective has receded somewhat in importance. We spend enormous sums on things and in ways which surely do not represent an economically optimum resource allocation, including in the transportation field alone the support of our non-competitive ship-building industry, massive aid for unwanted urban transit systems, extensive rivers and harbors work of dubious value except for private yachts and the like. Thus efforts to make regulation substitute for open market competition may be not only futile but positively harmful in that it focuses all the attention on the allocation of the resources to aviation and to various types of air transportation and very little on the distribution of the product in a broad and equitable manner. This is the real problem today, and it is one to which the competitive model (and regulation) gives relatively little attention. The focus of a new model should not be so much on the economic use of raw resources as on the efficiency and effectiveness of the distribution of the product.

This leads to a consideration of Proposition No. 5 - The possibility of developing a new regulating strategy for the future. Despite its critics, air transport is a remarkable servant in its ability to provide rapid mobility at relatively modest cost. While there is a good deal of hand-wringing to the effect that the air transport market has been largely developed and that future growth will be at a slow pace, a moment's reflection will indicate that this is almost certainly nonsense. In the first place only a relatively small proportion of the population flies in any one year (about 10%), and the bulk of them fly only once or twice a year (about 80% of those who fly). Thus the opportunities for market expansion are immense, even within the confines of existing services.

But there are some exciting new areas for mobility that have hardly been tapped as yet. Within Europe the packaged vacation tour at bargain prices (because operated in full aircraft) has become enormously popular - far more so than in this country.

Much more economical short-haul air transportation in STOL or VTOL aircraft should be technologically possible within the next decade. These and other essentially new markets, some perhaps not even dreamed of as yet, should be made available through the remarkable mobility that air transportation provides. But these services will not be made available broadly under present restrictive regulation and under a competitive structure that virtually insures that half of the product is thrown away at the plant door (in this case via a 50% load factor).

Each new air transport market and service has essentially been started and developed outside the established air transport industry - cargo, coach, charter and third level service. At the same time the established

industry has been a major force in bringing in new and more productive equipment. The specialist carriers and gad-flies have had neither the resources nor the assured future to do much in the equipment area. Perhaps, it is time that these forces were brought together.

We turn now to the sixth and last proposition of this paper - the elements of a new regulatory strategy. We have already suggested its keystone - the rapid opening up and spread of new services and markets. This could be accomplished in many ways - making awards to those who propose imaginative new types of service, holding an investigation or doing a study, with no lawyers allowed, to see what kinds of service people will want over the next decade and what kind of service new technology will permit, and then opening a proceeding to award certificates to those with the best proposals. There are at least two other elements. The first has to do with the length of time it takes for CAB to take action including giving the industry relief when it is in recession, either due to general economic recession or the actions of the Board itself, or both. For example, it took well over a year for the first capacity restriction agreement to come into force. Perhaps this was justified since it was a "first." But in future much prompter action, handled on an administrative, rather than on a quasi-judicial basis, would remove much of the pressure for upward price adjustments and would greatly help the financial posture of the industry. It is exactly this financial posture which is a third basic element of the new regulatory strategy. The rather erratic nature of airline earnings and particularly the recent heavy losses have led to a distorted debt structure for much of the industry and to mistrust on the part of a good deal of the financial community as to the financial attractiveness of the industry. The opening up of new markets and services will call for very large amounts of capital. Without a more attractive financial climate the nexus between economics and technology, so important for the future, cannot take place.

1173-32815

MERGERS AND ANTI-TRUST
ISSUES IN RECENT CAB CASES

by A. M. Andrews
CAB

July 19, 1972

Abstract

The airline industry is surveyed--particularly domestic trunklines--in relation to collective approaches to industry concerns. These actions are classified by the apparent degree of anti-trust issue present. Recent route merger cases are considered from the CAB staff viewpoint.

A. M. Andrews

My talk this morning will deal with two subjects. One is airline mergers. This seems to be a rather popular item. Three other speakers have chosen it as their topic. You will hear views expressed by representatives of such government agencies as Justice and Transportation, as well as by an airline official directly involved in a recent merger. He, of course, is Mr. Edwin Colodny, of Allegheny, who immediately succeeds me on this platform.

In order to round out a full circle of viewpoints, I thought it might be helpful to give you the thoughts of the Bureau of Operating Rights. This is the staff arm of the CAB that has the function of participating in airline merger cases before the Board. Our Bureau views may permit some useful comparisons and contrasts with later speakers.

My other topic--which I will discuss first--concerns cooperative or collective working arrangements among airlines. These are commonly referred to as Section 412 agreements. This is a reference to the section of the Federal Aviation Act which requires the filing of every contract, agreement or other cooperative working arrangement between air carriers which would affect air transportation. Specifically mentioned in the statute are agreements which involve (1) pooling of revenues or service, (2) establishing rates or fares, (3) improving safety and efficiency, (4) preventing destructive competition, and (5) regulating schedules and service. Here too, as in the case of mergers, the Bureau of Operating Rights in the primary staff group responsible for recommendations to the Board members as to approval or disapproval of such arrangements.

These two topics do have a relationship. In one sense an airline merger may be considered to be the ultimate form of cooperative working arrangement between airlines. This is so since one carrier cooperates to the point of actually going out of existence as an independent firm. In each case--be it merger or 412 agreement--

anti-trust issues may be present. And in each case any Board order of approval immunizes the arrangement from the applicability of the anti-trust laws.

In essence anti-trust laws are designed to assure that competing entities do not collectively engage in activities which diminish their competition with each other. Neither should collective activities harm some other person--like another competitor or a consumer.

As you are aware, the Federal Aviation Act contemplates a competitive airline system. Competitive forces--subject to regulation to avoid any destructive action--are the means by which the statute seeks to assure high quality air service needed by the traveling and shipping public. In such a statutory atmosphere, what is the proper role of cooperation among airlines in lieu of competition among them? I will attempt to point toward possible answers.

Some degree of cooperation among airlines seems vital from the traveler's viewpoint. The nature of air travel is evidence of this. In fiscal 1971 there were some 107 million domestic passenger journeys. In 16 percent of the cases, involving some 17 million individually travelers, two or more airlines were used to complete the journey. Such a high volume of interline passenger traffic places a very high premium on uniform arrangements in various aspects of passenger handling. This, then, accounts for a large proportion of cooperative arrangements governing through-ticketing, baggage handling, and so forth. Similar uniform arrangements cover other through transportation services such as freight and mail. In no sense would it appear that these kinds of arrangements are inimical to competitive objectives.

Another large class of cooperative arrangements--although not vital to the passenger or shipper-- have economic, rather than uniform service, basis. These have the objective of reducing carrier costs through the more effective utilization of capital investment. Examples are the joint sharing of station equipment, arrangements for aircraft maintenance and lease, joint use of city terminals, and so forth. Typically, these widespread arrangements have little effect in eroding competition or adversely affecting third parties.

There may be agreements in a murky middle ground area. But perhaps we should swing to the other extreme for benchmarks.

One area of acknowledged restraint of trade, where the impact of concerted actions on third parties raises anti-trust problems, involves the relationship between carriers and their ticket agents. Here the carriers have collectively developed detailed provisions for selection and retention of agents. They have also established rules relating to defaults and financial irregularities, and uniform commission rates for the sale of various types of air transportation. The problem which is created by uniform industry conduct in its relations with the agents is that individual carrier initiative in employing the services of such third parties is reduced to the level needed for a unanimous agreement. In approving these arrangements in the face of such anti-trust problems the Board found that in the absence of an agreement travel agents and air carriers would bid commission rates up to the highest level the market would bear. Also if carriers offered different commission rates a travel agent might find it difficult to serve as an impartial objective advisor to the traveling public.

A somewhat similar situation exists in relation to carrier agreements affecting labor unions. Under the airlines mutual aid agreement if a carrier is subjected to a strike it receives financial help from other members of the mutual aid pact. Possibly, this cools the ardor of the individual carrier to seek a prompt settlement. In approving the agreement, the Board found that it would contribute to the financial stability of air carriers. The Board further found that the agreements would not cause a deterioration in labor-management relations or destroy effective collective bargaining.

One Board case stands squarely for the proposition that competitive impact on third parties can be decisive. In 1959 the members of the Air Traffic Conference of America entered into an agreement entitled VOLUMAIR. Under the agreement the members of ATC proposed a program of concerted activities in the domestic commercial charter

market. This was designed to facilitate the collective availability of aircraft for charter service. The Board disapproved the arrangement after concluding that the agreement runs counter to anti-trust principles. The Board felt that such public benefits as would flow from the arrangement were outweighed by the broader public interest in safeguarding the fledgling supplemental air carrier industry in the nation's air transport system.

In the area of procurement it is clear that anti-trust problems can be present if collective airline purchasing power is utilized. The Board has permitted local service carriers to purchase collectively through a separate corporation owned by the participants. However, the stringent conditions attached to the Board's approval probably reduced the value of such authority, and the corporation was subsequently dissolved. In somewhat related instances the Board permitted collective design, negotiation and purchase of wide-body aircraft support equipment. The Board has also permitted the creation of a joint air carrier corporation to provide liability and hull insurance for wide-body aircraft. While there was widespread interest in both cases, there was no direct opposition and they were approved substantially in the form submitted.

With respect to trade associations, there continue to be issues concerning access to such associations and fairness of internal procedures, such as voting rules. These have been raised both with regard to IATA and the ATA. On the question of access, this is primarily applicable to ATA. There appear to be incipient issues concerning the exclusionary aspects of such matters as: collective airline tariff publishing; publishing of schedules in the OAG; access to Joint Airline Military Traffic offices; the availability of the Universal Air Travel Credit Plan; and the selection of local cartage agents for cargo pick-up and delivery. These matters are not burning issues at present, but they do represent items about which interest is being exhibited in some quarters.

Finally, there are scheduling agreements of two sorts. One stems from the limitations of airport and air traffic control capacity

around congested airports. The other involves schedule reduction agreements in certain major markets by certain major trunklines to prevent wasteful competition leading to excess capacity during a period of airline depression.

Scheduling agreements of the first type are designed to level out the use of congested facilities throughout the day in some equitable fashion. Such agreements are likely to continue to the extent that there continue to be overly-congested facilities.

Whether or not the second class of agreements, the schedule reduction agreements in major markets, are to become a normal way of life is an issue facing the Board during the current summer. Opponents of such agreements include other air carriers and the Department of Justice. They contend that joint agreements among competitors to limit capacity undo the competitive system envisaged by the Federal Aviation Act. They feel that by allowing carriers to stabilize their competitive activities in some markets, such agreements free up resources to be unleashed against non-signing competitors in other markets. Proponents of such agreements contend that they allow the aggregate product--airline seats--to be produced more closely related to market demands. This, they say, reduces the costs incurred in operating excessive flights. The Board will thus have to decide the controversial question of whether or not to grant pending requests for continuation of such arrangements beyond their presently scheduled termination in October.

I realize that the treatment here of collective airline arrangements is not exhaustive. But perhaps some insights are evident. On the one hand it is apparent that cooperative airline arrangements are necessary, can serve the traveling and shipping public, and can appropriately reduce costs. On the other hand the exercise of collective economic power with adverse impact on others can present a real problem. The Board in such instances will have to balance considerations of anti-trust with considerations of public interest of an air transportation nature. It does not seem possible in advance to establish

explicit guides as to what may or may not be acceptable. It does seem evident, however, that developing environment and ecological problems over the recent past portend an impact on traditional concepts of freedom to compete. The likelihood is for some compromises in this area.

I would now turn to the matter of airline mergers.

Merger discussions have probably been engaged in by all federally certificated route carriers in the airline recessionary economic cycle that is, hopefully, now ending. Previous down periods also were characterized by a least a large amount of merger talk--and some significant activity. In the last airline depression, in the early 60's, a Pan American-TWA merger application was filed and later withdrawn. An American-Eastern proposal was disapproved. And a failing regional trunk, Capital, was allowed to be absorbed by United to form the largest U. S. air carrier.

During the current cycle, seven route carrier merger applications have actually been submitted to the Board. Four involve mergers between two trunk carriers. A fifth involves a merger between two local service carriers. The remaining two relate to mergers between two carriers that are primarily domestic trunks, on the one hand, and two carriers specializing in Caribbean service, on the other hand. The Bureau of Operating Rights has actively participated as a party and has taken a position in all of these cases.

To date the Board has acted on four merger applications and has approved each of them. Two have resulted in consummated mergers, those between American and TCA and between Allegheny and Mohawk. One was aborted after approval, that is the Northwest-Northeast merger. One, involving Delta and Northeast, is now awaiting consummation which is scheduled for August 1.

The Bureau of Operating Rights favored the approval of each of these four mergers. A principal basis for the Bureau's position--which the Board shared for the most part--was that one partner was financially and competitively weak or failing. In this situation the stronger, dominant carrier offered the assurance that service would be continued and improved. Net financial impact was also considered

in detail. This included the important question of whether the merged company would operate more or less efficiently than either of the pre-existing airlines, both individually and on the average. In arriving at our position we balanced these "public benefit" factors against the negative aspects. The negative aspects were principally increased concentration in the industry, and diversionary impact on other carriers. Secondly, we took into account the "private benefits" of the merger-- that is, the effect on stock and bondholders, and on employees and creditors of both airlines.

In this group of four merger cases DOT favored the Delta-Northeast merger, and the Justice Department favored the Allegheny-Mohawk merger. These agencies did not participate in the other cases.

At this point it might be useful to clarify the roles of Justice, Transportation and the CAB. You may have some question concerning the necessity for three government agencies becoming involved in particular airline mergers. The CAB, of course, has final responsibility for approval or disapproval of airline mergers. This is subject to review by the President, as a matter affecting foreign relations, where international routes are involved. Justice participates as a party in CAB merger cases. This is primarily in situations where a significant issue of anti-trust policy may be present. DOT also participates in airline merger proceedings before the Board. It selects those cases where it believes significant transportation policy issues may be present. DOT has the role of coordinating governmental transportation policy. The executive agencies are free to suggest merger guidelines and policy irrespective of the pendency of particular merger applications. The CAB on the other hand is limited in this respect to the role of approving or disapproving on an ad hoc basis. Individual merger applications must be decided on a formal record developed in such cases.

Still pending are three merger cases: the American-Western and Eastern-Caribair cases are before the Board for decision. The Northwest-National case is now awaiting oral argument before the Board.

The Bureau opposes all three of these mergers. Our conclusion with regard to both the American and Northwest cases is that the proposed mergers would be antithetical to the preservation of a competitive

multi-carrier air transportation system. They would, therefore, result in undue concentration. On the long-term, we think that undue concentration will lead to higher costs and overall lessening of efficiency as well as higher prices, and less responsive service. We feel also that they bring the evils that inhere in the concentration of too much economic power in too few hands, including labor's. Our view is that air transportation is inherently competitive in character and can operate at optimum efficiency for the general economy under competitive conditions. This can be distinguished from operating at optimum profitability for the stockholders of any one firm, or of a small group of firms. Balancing the marginal positive factors favoring these two mergers, we concluded that the negatives outweighed. In this process, we gave particular weight to the fact that all the merger partners involved are prosperous, growing, soundly managed carriers with bright futures as independent entities.

The Department of Justice agreed with this basic approach, while the Department of Transportation did not. DOT appears to believe that any merger not creating a high degree of monopolies in specific city-pair markets should be approved. This apparently means that mergers between airlines whose systems do not overlap extensively should be approved.

In the case of the Northwest-National, we also stressed that there was no plan of integration for the two airlines, and that management dissension and labor unrest could cause serious difficulties.

The Eastern-Caribair merger is altogether different, in our view. Caribair is a failing carrier that is authorized to provide local-type service principally among the islands of the Caribbean. We think it should not be converted into a mainland-Caribbean trunk operation in what is, after all, the second largest area-type market in the world--the U. S.-Caribbean/Bahamas vacation market. Such a basic restructuring of a major area-type market should be effected in a careful, gradual fashion through route cases--rather than at one fell swoop in a merger case. This is so particularly in light of the diversionary impact on

Pan American. Neither Justice nor DOT took any position in this case.

At such time as the Board ultimately rules on the remaining undecided merger cases we will have completed the current cycle of proceedings. These decisions, in toto, should provide useful, concrete criteria for airline merger policy in lieu of the hypothetical guides which have been the subject of much discussion during recent periods.

This concludes my presentation.

N73 - 32896

DEPARTMENT OF TRANSPORTATION MERGER POLICY

by John Gillick
Department of Transportation

July 19, 1972

Abstract

This presentation will discuss DOT's policy with respect to evaluating airline mergers. Included within this presentation will be a discussion of: (1) DOT's statutory responsibilities; (2) DOT's view of the interrelationship of airline merger policy and overall airline policy; (3) the executive branch criteria for domestic airline merger proposals; and (4) DOT's position in several recent merger proceedings, including the Allegheny-Mohawk, American-Western, Delta-Northeast, and Northwest-National.

It is indeed a pleasure to be here for this workshop and I would like to thank the joint sponsors, MIT and NASA, for this opportunity to discuss what I, as a trial attorney in the General Counsel's Office, understand the Department of Transportation's airline merger policy to be.

As is indicated in the summary of my discussion, I will focus on the following general areas:

- DOT's statutory responsibilities with regard to the formulation of national transportation policy;
- DOT's view of the interrelationship of airline merger policy and overall airline policy;
- The Executive Branch criteria for domestic airline merger proposals, which are designed to assist the Executive Branch agencies in evaluating domestic merger proposals;
- And finally, DOT's position in several recent merger proceedings, including the Allegheny-Mohawk, American-Western, Delta-Northeast and Northwest-National cases.

The Department of Transportation participates extensively in proceedings before the Civil Aeronautics Board, among other regulatory agencies, and, as a consequence of the several merger applications filed recently, we have been actively involved in four major merger cases in the last year.

You have already heard today from Mr. Andrews of the Civil Aeronautics Board, Mr. Colodny who expressed the airline viewpoint on mergers and Mr. Farmer of the Antitrust Division of the Justice Department, and you may be wondering why the Department of Transportation participates in these cases.

The Department of Transportation is the Executive Department charged by Congress with exercising general leadership in the identification and solution of transportation problems with responsibility in the Secretary of Transportation to provide leadership in the development of national transportation policies and programs.

Mergers of major transportation companies (all the air carrier trunklines are listed among Fortune's top 50 transportation companies) in many instances have an impact on both the quality and cost of transportation services available to the public, and can have far-reaching effects in terms of restructuring a transportation industry. These matters are necessarily of vital concern to DOT and, as a consequence, participation by DOT in these proceedings is necessary and appropriate for the discharge of our statutory responsibilities.

In addition, the President is required by Section 801 of the Federal Aviation Act to review all mergers in which international routes are involved to determine whether the resultant route transfers are consistent with the foreign aviation policy of the United States. In that regard, it may be necessary for the Executive Branch agencies to participate to develop a full record on these issues, for on occasion,

the President has found it necessary to alter a Board recommendation when foreign policy requirements have dictated such a result.

It is sometimes claimed that all or most U.S. airlines (at least the trunklines) should be rationalized by merging them into a smaller number of systems (four, five, or six being the most common numbers mentioned). Lest there be any question in that regard, the Executive Branch criteria specifically state that they should not be interpreted as implying encouragement to airline mergers in general, or in specific cases. That was not their purpose. The Executive Branch, and, in particular, the Department of Transportation supports a policy of vigorous competition among a considerable number of air carriers. Often, in fact, the Department of Transportation has been the subject of criticism for taking positions which are said to be "too pro-competitive".

In the American-Western case, the Department argued that the merger would increase competition by replacing a carrier (Western) with a history of ordinary performance as a competitor with one (American) that all the parties to the proceeding agreed competes hard and well. As a consequence of the limited number of carriers authorized to serve any given market, the replacement of one carrier by a more vigorous competitor is bound to improve the quality and degree of competition in the affected markets. The carrier opponents of this merger criticized us for encouraging such competition. Again, in the Northwest-National case, we argued that the merger would increase competition in the air carrier industry by providing additional competitive services and

permitting the "new" Northwest to compete on a more equal footing with such rivals as United, Pan American, and Eastern. Again this position was criticized, and in fact, the main argument advanced by Eastern in opposition to the merger was that the "new" Northwest would be too strong a competitor.

In the Domestic Passenger Fare Investigation, the Department has argued strenuously for the Board to permit price competition in the airline industry by adopting a "zone of reasonableness" in setting fares. Under our concept, the Board would establish a maximum and minimum lawful fare in each market and then the carriers would be left to compete by offering fares anywhere within the zone. Although our proposal received the strong support of the Antitrust Division, it met stiff opposition on the part of many carriers. The Board has recently heard oral argument in the case and we are hopeful that our proposal will be adopted.

And finally, the Department has supported more liberalized rules for charter travel, arguing that such liberalization is beneficial to the traveling public and should be permitted so long as substantial impairment of scheduled service does not result. I am sure that Mr. Binder will amplify the Department's position on this matter on Friday during his discussion of "International Air Transport and Federal Policy".

Returning to merger policy, the Department's attitude is to simply take airline mergers as they come. Mergers are the result of healthy

business procedures, long recognized as a form of company self-improvement. In as dynamic an industry as the airline industry, they are merely signs of a healthy industry restructuring itself. All mergers are certainly not prohibited in either regulated or unregulated industries, and as recognized by Congress, mergers of transportation companies have different requirements than mergers in the unregulated portion of our economy. Accordingly, the analytical techniques of the antitrust laws (such as the market share standards developed under the Clayton Act to test grocery store and beer company mergers) have little relevance to airline mergers under the Federal Aviation Act. Secor Browne, the Chairman of the Civil Aeronautics Board, has aptly described the attempt to use such analytical techniques for airline mergers as the "clam gauge test" for mergers. If you think about it, you will see the sheer folly of such an approach. In airline mergers, we are dealing with a regulatory body with a demonstrated expertise for evaluating competition in the airline industry. Accordingly, we believe that the appropriate tests for measuring competition are those set forth in the Executive Branch criteria which I will discuss shortly.

In attempting to develop criteria for evaluating airline mergers under the Federal Aviation Act, it is important, of course, to know if average cost varies with firm size. At approximately the same time that the Department was preparing the criteria, we were also conducting a study, for use in the Domestic Passenger Fare Investigation, to determine whether costs increase, decrease or remain the same in the domestic

airline industry -- such studies being generally referred to as economies of scale studies. This study was relevant to the fare investigation in order to determine what pricing policy the Department should recommend to the Board, but was also applicable to mergers where the relationship of average cost and firm size is also an important policy determinant.

In this study, conducted by Dr. James C. Miller (who was here last week and will again appear Friday), multiple regression analyses were performed on airline data by carrier and by year, for the years 1962-1968, to determine if a relationship existed between available ton-miles, average stage length, market density and costs (measured by operating expense per available ton-mile). (For those who are interested in the details of the study, I have brought a copy of the study for your perusal, but I suspect that the most productive approach for pursuing questions about the study would be to talk to Dr. Miller when he is here on Friday.) In summary, the results of this regression analysis indicate a tendency toward constant returns to scale (that is, constant costs over the relevant range of service) when available ton-miles and market density are increased proportionately, and increasing returns (that is, falling average cost) when expansion takes place over new routes. In both cases, however, the effect on average cost is barely perceptible, stage length being a more important determinant of the level of average cost. For practical purposes, then, we concluded that the industry is characterized by constant returns to scale and that, as a consequence, increasing the size of the firm through merger is unlikely to produce significant unit cost increases or decreases.

In light of this study, which indicates the indecisiveness of sheer size on the matter of costs, we believe that changes in size per se should not be determinative of the outcome of a merger, and that the focus in evaluating airline mergers should be on the impact of a merger on industry performance. The Executive Branch criteria are intended to assist the Department in measuring this impact.

During the spring and summer of 1971, the Department of Transportation, in consultation with the Department of Justice, prepared the Executive Branch criteria for domestic airline merger proposals. The purpose of these criteria for evaluating domestic airline mergers is to assist the Executive Branch agencies in deciding whether to intervene in airline merger cases before the Civil Aeronautics Board and in deciding what recommendation, if any, should be made to the Board concerning the merger. Although these criteria were designed by those Departments for general use by the different Executive Branch agencies, each agency necessarily will apply them in light of its respective statutory responsibility. In the case of the Department of Justice, as alluded to above, this will be primarily under the antitrust laws, and in the case of the Department of Transportation, primarily the Department of Transportation Act, other related statutory and policy provisions, and basic operational and economic factors relevant to the transportation system of the nation.

As is recognized in the statement accompanying the criteria, certain caveats are in order:

First of all, it is not possible to devise a set of general criteria that will completely cover each and every fact situation. There will be instances where certain criteria are not applicable, or where a criterion must be extended or refined, or where additional data are applicable. At the same time, the criteria are meant to be looked at as a whole. There is not any one criterion of overriding significance.

Second, because of limited resources, Executive Branch agencies may not intervene in all merger proceedings.

And third, not all agencies evaluating factual material and applying these criteria will necessarily reach the same conclusion.

In order to reconcile public objectives with business objectives, the preparation of these criteria has drawn extensively on two types of background data:

- (1) the relevant statutory and policy backgrounds; and
- (2) the relevant airline operational and financial factors.

With regard to the statutory and policy background, we reviewed existing regulatory statutes and other applicable policies governing airline mergers in order to define criteria already present in law and policy as found in the Federal Aviation Act, its legislative history, and the interpretation it has been given by the Board and the courts. Consideration was also given to standards used by Federal agencies and the courts in appraising mergers under other regulatory statutes and the antitrust laws, particularly Section 7 of the Clayton Act. With respect to the economic facts of the industry, we analyzed efficiency, profitability,

service, structure of the airline passenger market, and economies of scale in airline operations.

Although I do not wish to burden this discussion with the intricate details of the criteria themselves, I do think it would be instructive in giving some insight into DOT's approach to mergers to briefly highlight the major factors which we consider in evaluating an airline merger, and indicate how the various criteria were applied in certain cases.

(For those who are interested, I have some copies of the criteria and will be glad to distribute them at the end of the discussion.)

Basically, the criteria are designed to provide a means for evaluating the following aspects of a merger:

- Impact on competition;
- Likelihood that it would breed, or trigger, other mergers;
- Impact on other carriers;
- Benefits resulting from the merger;
- Financial health of the merger partners; and
- Protection afforded employees.

As discussed earlier, competition plays an important role in maintaining a sound air transportation system and the competitive impact of a merger on the air carrier industry should be carefully analyzed.

The criteria provide that a merger should not result in either the elimination of effective competition, or an excessive market share for the surviving firm in significant city-pair, regional or national markets for airline services.

In general, air carriers compete on a city-pair basis. They compete for the business of the traveler who wants to get from point A to point B. In order to measure that impact, the criteria provide three basic tests:

Test 1. Mergers which involve the significant lessening of competition in the major markets (defined as the 100 top city-pair markets measured by number of passengers plus those of the 100 top city-pair markets measured by number of passenger miles which are not already included), especially the larger ones, must be regarded as carrying a heavy burden of proof, certainly the elimination of an effective competitor (one having at least 10% of the market) from a city-pair market having as much as 1% of the total industry passenger miles would be cause for most serious scrutiny.

Tests 2 and 3, which are designed to analyze the impact of a merger on competition in all city-pair markets, work in the following manner:

First of all, one would identify markets in which a given anti-competitive impact would occur:

One such test would first ascertain in which markets the merger would eliminate an effective competitor (usually regarded as a carrier with a 10% market share).

Another such test would ascertain in which markets the merger would combine two carriers, each of which had less than a 50% market share, to form a carrier with a 50% or greater market share.

And then one would evaluate the overall magnitude of the markets so identified.

For each test, the size of the markets affected need not be especially large in comparison with the overall industry in order to attain a degree of significance worthy of concern. But, as the total traffic in affected city-pair markets exceeds 1%, and certainly as it approaches 3%, the competitive effect becomes more significant and warrants careful scrutiny.

In examining these city-pair criteria, it was interesting to learn that the carriers participate in traffic in markets in which they are not authorized to provide service. For example, in 1970, Northwest carried 1,310 passengers and National 4,130 passengers in the New York-Los Angeles market, even though neither carrier is authorized to serve that market. When we investigated the matter, we found that this traffic was the result of passengers traveling on circuitous routings, such as by way of Minneapolis in the case of Northwest, and Miami in the case of National.

Although air carriers generally compete on a city-pair basis and the focus must remain on the merger's impact on competition in city-pair markets, the effect of a merger on competition must also be considered in terms of regional and national markets. In the Northwest-National merger, for example, we considered the regional impact of the merger by analyzing the number of passenger originations by carrier and State for the two regions arguably affected by the merger -- the northeast corridor and the southern region of the country. In the northeast, the analysis revealed

that the region will continue to be dominated by American, Eastern, United and TWA, and that fifteen carriers will remain, not to mention the substantial intermodal competition in this corridor, which will be unaffected by the merger. Likewise, the analysis indicated that the Southern region will remain Delta and Eastern country and no less than twelve other major carriers will continue to serve the region.

The other basic competitive consideration is that a merger should not result in undue concentration within the air carrier industry. Although relative size in the airline industry is an important consideration, it is not suggested in the criteria that size alone should be the only or even the major merger criterion. On the other hand, a proposed merger that would result in a substantial share of an appropriate market must be viewed as carrying the burden of proof that the anti-competitive impact would be balanced by benefits to be realized by the public, and, as the market share of the resulting firm increases, the burden of proof to establish counterbalancing benefits would become increasingly heavy.

In the American-Western case, we recognized that the principal problem presented by the merger is the post-merger size of American (post-merger American would carry almost one fifth of the domestic ton-miles carried by all U.S. carriers). We believed that balancing the benefits resulting from the merger against one potentially serious detriment, size, showed that the merger should be approved.

The criteria further provide that a merger should not be likely to lead to extensive reactions and defensive merger proposals by competing

carriers so that the end result will be a restructuring of the industry and excessive concentration in a few firms. Although the effect that a particular merger is likely to have in breeding, or triggering, other mergers is a most important consideration, there does not appear to be a way of analyzing this question with precision.

Board approval of a merger may trigger mergers in one of two ways:

(1) it could indicate that the Board would be likely to approve other mergers and as a result other carriers would consider proposing mergers, and

(2) it could also create a situation in which other carriers would have to merge to avoid financial difficulties.

Analysis of the first alternative must necessarily involve consideration of various relevant factors, such as the impact of a merger on competition in city-pair markets, to determine the precedential impact of Board approval of a merger. But in this regard, it is important to remember that any merger proposed as a result of misreading the Board's signal obviously could be disapproved. In a regulated industry, the trigger potential of a merger must be viewed in a different light than in the case of an unregulated industry.

With regard to the second alternative, consideration should be given, among other things, to the impact of the merger on individual carrier market shares, the protection of connecting traffic and whether the particular merger may have a "run-on-the-bank" effect. For there are only so many suitable merger candidates for any particular carrier

and a carrier may conclude that the way to avoid disappointment is to merge early.

A series of mergers could easily undermine the existing competitive structure of the industry, even though no one of the mergers in the series taken by itself could be found objectionable under the remaining criteria. If a merger seems likely to trigger such a series, the total competitive effect should be examined.

One of the requirements of the Federal Aviation Act is that the Board is to pursue sound economic conditions in the air transportation industry. Accordingly, the criteria provide that a merger should not result in substantial foreclosure of competition for interchange traffic or other excessive injury to other carriers.

A merger which would severely injure other carriers might so disrupt sound economic conditions in the industry that it should be disapproved. In examining the direct injury, consideration should be given to whether the merger will so increase the market power of the merged carrier (for example, by being able to offer more seats or schedules or more advertising) that a third carrier, or other carriers, will find it substantially harder or impossible to compete for competitive or connecting traffic. Indirect injury may come about over a longer period of time through the impact of the merger on costs and financial ability, and will surface in the form of the weaker carrier's inability to purchase adequate equipment or promote its service.

An end-to-end merger of two airlines which connect at points of substantial traffic interchange can foreclose competitors from connecting traffic which was previously subject to free competition. Although this diversion can take place simply because the merger may permit offering better service, it can also take place when service improvement is not offered, for example, because a passenger seeking connecting service is more likely to contact an airline providing both legs of the route or is more likely to contact the better-known airline. Again, this diversionary impact must be carefully considered in evaluating the impact of the merger on other carriers.

An airline merger should be accompanied by significant operational or service advantages so that there is greater efficiency or lower costs to the public. More effective use of aircraft and equipment, more economical financing, new route patterns and innovations in management -- these are required for the health and further growth of the industry.

The longer term characteristics of the airline industry are rapid traffic growth and expansion into new markets with different characteristics in terms of fares and schedule requirements. A fundamental need of the industry is for continued adjustment, and the major effect of a merger should be to accommodate this need. As a consequence, the criteria provide that a merger should bring about substantial operational, service, or organizational benefits for the surviving firms so that the public will receive significant benefits such as greater efficiency and better service, and the size of the airline resulting from the merger should not be such as to produce significant diseconomies.

In the case of a merger of a relatively effective carrier and one that is marginal, or in the case of two marginal carriers, the criteria provide that the resulting benefits of the surviving firm should be corrective of the original difficulty of the weaker merger parties. The public may in some cases benefit from acquisition by a stronger carrier of an airline whose potential for maintaining viable operations is limited for some demonstrable reason, but it is questionable whether absorption of a marginal firm is in the public interest if the surviving firm is thus put in jeopardy. In the Delta-Northeast case, one of the reasons that the Department supported the merger was that Northeast, a carrier in serious financial difficulty, could be absorbed by Delta, a financially healthy carrier, with profitable results -- a benefit to the air carrier industry as well as the traveling public. As mentioned by Mr. Colodny, the criterion was also relevant to the Allegheny-Mohawk merger.

With regard to the impact of the merger on employees, the criteria provide that the labor protective conditions (such as integration of seniority lists and displacement allowances) set forth in the United-Capital merger case should be imposed, unless it can be established that it would be in the public interest to alter or replace the standard provisions. In the Northwest-National case, the Department believed that the integration of the work forces of the two carriers raised the possibility of labor problems which we did not believe were adequately covered by the standard United-Capital conditions, and, accordingly, recommended that the Board fashion conditions to alleviate the problems.

Any airline merger will have some effect on the structure of the airline industry, but mergers are certainly not prohibited per se because of this. In the American-Western case, one of the reasons that the Examiner recommended disapproval of the merger was that he felt that the merger would upset the existing national airline structure consisting at the time of the "Big Four" and the "Smaller Seven" trunklines. As we argued in our brief to the Board in that case, and recent Board approval of the Delta-Northeast merger which created a "Big Five" rather than a "Big Four" and Allegheny-Mohawk which created a carrier much like a regional trunk has demonstrated, such a static way of looking at airline industry structure is misplaced. In as dynamic an industry as the airline industry, one simply cannot expect its structure to remain the same for long periods of time.

Board route policy has also stressed carrier development and has not been designed to freeze any particular size distribution or number of firms. Thus the Board has pursued a continuing policy of permitting existing carriers opportunities to expand over new routes and has permitted entry of new carriers when a need has been shown for such services. In a merger case, we do not believe that the Board should be concerned with preserving a particular number or size distribution of carriers. Rather, the increased size of a carrier or a reduction in the number of firms in the air carrier industry is critical, we believe, only to the extent that overall industry performance, measured by the impact of the merger on rates and service in the affected markets and in the industry as a whole, is effected.

It is likely that rates will increase over time if the combination of two carriers results in a less efficient operation and overall costs increase. It is also possible that a substantial lessening of competition, insignificant city pairs, or other relevant markets could lead to implicit price collusion between the carriers who remain. As a result of such conscious parallelism or price leadership, or simply less intensive competition, service to the public could deteriorate and fares rise unnecessarily. If a merger were to decrease competition substantially so as to result in increased costs, the Board might well be seriously concerned about the merger's impact on industry structure. Even assuming, however, that the elimination of one firm from the domestic air transportation industry and a resulting change in the size distribution of the remaining firms does have some effect on industry performance, that effect must be kept in perspective. As Dr. James Miller testified on behalf of the Department of Transportation in the Northwest-National merger case, "While the performance of the industry may be a function of the number of firms and their size distribution, of much greater significance is the regulatory environment -- the degree to which the Board allows and encourages competitive forces to bring about greater efficiency, lower prices, and improved service".

If the Board is concerned about maintaining competitiveness within the airline industry and insuring good performance, it should consider amending those aspects of its policies which reduce competition. Minor but far-reaching changes in the Board's policy toward encouraging price

competition (such as recommended by DOT in the Domestic Passenger Fare Investigation) and more liberal attitudes toward the entry of new firms and the expansion of existing firms into new competitive markets, would be far more likely to promote effective competition than adherence to a rigid policy toward industry structure.

During the past year, the Department has evaluated four airline mergers (Allegheny-Mohawk, Delta-Northeast, American-Western and Northwest-National) in light of these criteria, has found that they are consistent with national transportation policies and has recommended to the Civil Aeronautics Board that the mergers be approved. Since the facts of each merger are different, the reasons offered by the Department in support of each merger varied from case to case.

In Allegheny-Mohawk, the Department recommended approval of the merger as being in the public interest since it would result in numerous new single carrier services in markets where the carriers were limited previously to providing connecting service, increased competition for the large trunklines in a number of important regional markets and provide a solution to Mohawk's financial difficulties. On March 28, 1972, the Board approved the merger and it was consummated shortly thereafter.

The real significance of this merger for the public interest, however, is that Allegheny is beginning to take on some of the characteristics of a regional trunkline. Merged, it is serving the entire northeast quadrant of the country, ranks as the sixth largest U.S. airline in terms of passengers enplaned, has increased its market identity at the significant

hubs of Pittsburgh, Cleveland, Detroit and Buffalo, and now stands in a much stronger position in both new and pending route cases.

In Delta-Northeast, the Department believed that the merger would benefit the public by substituting a financially healthy carrier and vigorous competitor (Delta) for a chronically loss-ridden carrier and a generally weak competitor (Northeast) which will, in turn, result in improved service and livelier competition over Northeast's system and throughout the east coast-southeast area. Although, as I mentioned above, Northeast was not a failing carrier, it was a carrier characterized by chronic financial problems and a consequent inability to provide vigorous competition. The substitution of Delta for Northeast, we believe, will improve the overall health of the air carrier industry. On April 24, 1972, the Board approved the merger, but it has not been consummated to date, pending the consideration of petitions for reconsideration by the Board.

In American-Western, the Department urged approval because we believed that the merger will provide benefits to the public in terms of improved service in the form of new through plane routes in several markets that will be of value to the traveling public and, as discussed above, will result in the replacement of a strong competitor for a carrier with a history of very ordinary performance, lower costs reflecting, among other things, consolidation of operations at common locations and improvements in aircraft utilization which, in turn, flow from an improved route structure and a better mix of aircraft without diverting substantial

amounts of traffic, reducing competition, triggering other mergers, or resulting in undue concentration within the air carrier industry. This merger is still pending.

Finally, the Department supported the Northwest-National merger since we believe that the merger will serve the public interest by providing --

- The "new" Northwest with an opportunity to offer substantial amounts of new service to the public without significantly increasing the capacity offered by the surviving carrier;
- Reduced costs resulting from savings in services and personnel at common stations and in aircraft maintenance; and
- Increased competition without materially affecting any carrier's financial health, triggering other mergers or adversely affecting the structure of the air carrier industry.

The case is now before the Board and oral argument will be held next Wednesday.

Taken as a whole, these mergers provide several interesting parallels. First of all, each of them involves a minimal impact on actual competition, and, in fact, one of the purposes of the mergers was to make each carrier a stronger firm and thus better able to compete with its rival carriers. Moreover, the public will receive tangible benefits in

the form of numerous new services. And finally, each of these mergers will fill previously existing gaps in the surviving firm's systems, such as Delta's chronic inability to get to the northeast and thus will result in the rationalization of their route structures.

As you can see, it has been a busy year for the Department in terms of evaluating airline mergers, and we believe that the Executive Branch Merger Criteria have been useful in that effort.

Thank you.

N73-32897

JUSTICE DEPARTMENT AIRLINE MERGER POLICY

by Donald A. Farmer
U.S. Justice Department

July 19, 1972

Abstract

Justice Department airline merger policy is developed within the context of the Federal Aviation Act, in which there is an unusually explicit reliance on competition as a means of fulfilling statutory goals. The economics of the airline industry appear to indicate that low concentration and vigorous competition are particularly viable and desirable. Several factors, including existing regulatory policy, create incentives for airlines to merge whether or not an individual merger promotes or conflicts with the public interest. Specific benefits to the public should be identified and shown to clearly outweigh the detriments, including adverse competitive impact, in order for airline mergers to be approved.

In the formation of regulatory policy, the Justice Department will continue to urge upon regulatory commissions the basic legal point that "to a very great extent, competition is our fundamental national economic policy,"/and the basic factual point that economic regulation by administrative agencies can be supplemented and made more effective by the self-regulating device of competition.

The Justice Department has been rather selective in intervening and participating in airline merger proceedings, and has usually participated only in cases of unusual significance. We participated in the American-Eastern proceeding in the early sixties, and have participated in two of the recent round of merger proposals, the American-Western and National-Northwest cases. In each case, we have concluded, after studying the evidence, that the proposed merger should be disapproved because of its anticompetitive effects.

Since the Department's policy with respect to airline mergers has mostly been developed in the context of the trunkline merger proceedings to which we have been a party, my remarks will be directed primarily toward that type of airline merger -- the merger of domestic CAB-regulated trunklines.

I. The Statutory Context

There are two ways in which section 408(b) protects against anti-competitive mergers. First, the "antimonopoly proviso" provides that no merger shall be approved when the result would be "to create a monopoly and thereby restrain competition or jeopardize another air carrier not a party to the merger." Second, the merger standard requires that mergers must be found consistent with the public interest to be approved, and as I will demonstrate below, the public interest standard considerations into the process of merger approval.

-/ Carnation Co. v. Pacific Westbound Conference, 383 U.S. 213, 218 (1966)

First a word about the antimonopoly proviso. Its rather peculiar wording has not been subject to much interpretation in agency proceedings or in court, probably because many merger proposals which would clearly create substantial monopolies are never filed - and it is fortunate that they are not. This in turn may be because the antimonopoly proviso is a flat prohibition, not a balancing test, and applicants do not have the opportunity, as they do in the public interest balancing process, to argue offsetting public benefits.

The Air Mail Act of 1934, the first statute imposing economic regulation upon air carriers made it illegal for air mail contractors serving parallel competitive routes to merge. --/The drafters of the economic regulatory provisions which were central to the Civil Aeronautics Act and later the present Federal Aviation Act strictly and specifically prohibited the creation of monopolies through merger. The modifiers "unduly" and "unreasonably" were struck from the proviso, and discussion by the legislation's sponsors in the Senate indicated that the intent was to forestall "rule of reason" interpretations. --/The clear result is to remove from the Board any discretion to approve a merger which would violate the proviso, even if the Board feels that the merger otherwise would be quite desirable.

--/Air Mail Act of 1934, ch. 466, §15; 48 Stat. 938.

--/See Brief of the United States of America 3-5 (July 31, 1962), American-Eastern Merger Case, CAB Docket No. 13355.

Airline merger standards are strongly influenced by the fact that the Federal Aviation Act and its legislative history evidence a heavy reliance on competition, both generally and specifically with respect to mergers. The Act makes clear that the purpose of economic regulation is to promote the public interest, and defines several specific elements to be taken into consideration in regulatory decisions based upon the public interest. Unlike other transportation regulation statutes, the Federal Aviation Act specifically provides that "(c)ompetition to the extent necessary" is one of these specific elements of the public interest. -/This is an unusually specific reliance upon competition for an economic regulation statute, and calls for an exceptionally close examination of the consequences of regulatory actions upon the competitive relationships among the regulated firms. -/

The specific merger section of the act, section 408 also evidences the high value placed upon competition in regulated air transportation. The "antimonopoly proviso" of that section is to my knowledge unprecedented in other transportation regulation statutes. It is clear that it was intended by the Congress to express a desire that mergers not lead to anticompetitive situations.

As an indication of the intention of the Congress with respect to airline mergers, Senator McCarran, who is credited with being the author of the bill, said:

"I have tried studiously and zealously to select the language from the decisions of the Supreme Court, from the rulings made by Commissions, from my experience, and from

-/ Federal Aviation Act, section 102(d), 72 Stat. 740 (1958), 49 U.S.C. 1302(d)

-/ Recommended Decision of Examiner Robert L. Park, Northwest-National Merger Case, Docket 23852, May 22, 1972, p. 48

my training in the law-- which will do two things: First of all, comply with the anti-trust laws of the country so as to provide the greatest protection for competition. Secondly, give a high degree of flexibility to human judgment when I select an agency to exercise human judgment."

Despite the rather clear evidence of the procompetitive thrust of the Federal Aviation Act and its merger section, it has been argued that because of the wording of section 408, and the fact that the section was worded slightly differently in draft bills which were not enacted, the Board is constrained to approve merger applications when their impact on the public interest is doubtful; in other words, that section 408 places the burden of proof upon the opponents of merger applications. -/ (Section 408 says the Board shall approve merger applications unless it finds them inconsistent with the public interest.) I believe it is somewhat strained to conclude that the Congress decided to reverse the procompetitive thrust of the Act -- in one of the most important sections of the Act -- without some explanation in the legislative history. The language of section 408 hardly shows a clear intention to do.

The precise wording of the standards for regulatory approval in various sections of the Federal Aviation Act, and in other transportation regulation statutes, varies considerably, and agencies and courts correctly look to the regulatory purpose of the Act and the particular section to resolve issues of burden of proof, rather than searching

-/ 83 Cong. Rec. 6729-32

-/ See Brief of the Department of Transportation to the Civil Aeronautics Board, Northwest-National Merger Case, Docket 23852

for hints from slight differences in language.

An example of this approach is provided by the standard for approval of agreements among competitors under section 412 of the Federal Aviation Act. -/ That section provides that the Board shall disapprove such agreements that it finds to be adverse to the public interest. This appears to be negative wording like that of section 408(b), yet the Board explicitly applies the following standard in section 412 cases: if the transaction would have a substantial anti-competitive effect under established antitrust principles, it should not be approved unless approval is the only way to meet a serious transportation need or secure an important public benefit. -/The Supreme Court has approved this test as a basis for agency disapproval of a transaction under a section of the Shipping Act with very much the same language as section 408(b). -/

One other section of the Federal Aviation Act relates to approval of mergers: the Board must approve the transfer of routes from one carrier to another, as provided in section 401(h). 49 U.S.C. 1301(h). The Board has repeatedly held that an affirmative showing of consistency with the public interest is necessary for such a transfer. -/

-/ Application of Trans World Airlines, CAB Docket 22908, Order No. 71-8-91 p.5 (1971); Local Cartage Agreement Case, 15 C.A.B. 850 (1952); North Atlantic Tourist Commissions Case, 16 C.A.B. 225,226 (1952); Six Carrier Mutual Aid Pact, 29 C.A.B. 158 (1959). The Supreme Court has confirmed the appropriateness of an identical standard in Federal Maritime Commission v. Svenska Amerika Linien, 390 U.S. 238,244, 246 (1967).

-/ Federal Maritime Commission v. Svenska Amerika Linien, 390 U.S. 238 (1968).

-/ Acquisition of Marquette by TWA, 2 C.A.B. 1,4 (1940); Pan American Airways, Inc. et al. - Merger, 2 C.A.B. 503,505 (1940); acquisition of Cordova Air Service by Alaska Airlines, Inc. 4 C.A.B. 708, 709 (1944) Acquisition of Mayflower Airlines, Inc., by Northeast Airlines, Inc., 4 C.A.B. 680,681, (1944); United-Western Acquisition of Air Carrier Property, 8 C.A.B. 298, 301 (1947); Mackey-Midet Acquisition Case, 24 C.A.B.51,56 (1956); Delta-Chicago & Southern Merger Case, 16 CAB 647, 685-686 (1953); Frontier-Central Merger Case, E-26968, June 24, 1968, I.D. p.2

Merger proponents have tried to escape the provisions of this section by taking some passing language from a court decision or two that the "public convenience and necessity" standard for transfer of route authority is not identical to the "public interest" standard applicable to merger approval. They then try to whisk away the fact that route transfer is usually the primary objective for which certificated airlines are merged, and assert that the section 401(h) standard somehow does not apply.

It would make little sense for the Board to require a showing of affirmative public benefit for the award of new routes or the transfer of routes apart from a merger, and yet require only a showing of neutral effect on the public interest when the route transfer takes place in conjunction with a merger. Making it easier to acquire new routes through merger than otherwise would create a powerful incentive for mergers and further concentration, and would have an adverse impact on the structure of the airline industry.

Apart from the specific requirements of the Act, there are reasons more or less generally applicable to the regulated industries why regulators should be extremely cautious in approving mergers. To begin with, the Supreme Court has made clear that the fact that an industry "is a highly regulated industry critical to the Nation's welfare makes the play of competition not less important but more so." -/ I will discuss the specific application of this principle to the airline industry later, but the general point is that excessive concentration and other market structure characteristics are quite significant in industries which are subject to economic regulation. -/

-/ United States v. Philadelphia National Bank, 374 U.S. 321, 372 (1963).
-/ Id. 368.

Exit of a regulated firm through merger can have a special competitive significance not present in the exit of an unregulated firm.

Further, the quality of the regulatory decision making process is enhanced if the burden of proof is put upon merger proponents. Merger applicants have more access to and familiarity with the particular facts of their business than prospective opponents. Merger partners initiate the timing of the merger process, and can begin preparing their legal case well in advance of the formal proposal or the application for regulatory approval. Therefore, the merger partners may be in a better position to prove their case than the opponents are to prove theirs.

Finally, the burden of proof should be placed upon the side which will suffer the least irreversible damage if the wrong choice is made. If a merger proposal is denied when in fact it would have brought net public benefits, it can be approved later when more convincing evidence comes to light or the error is perceived. The public benefits which the merger might have brought in the interim could be achieved at least in part by internal growth. But if a merger is mistakenly approved and consummated even though there would be no net public benefits, the merger would be practically impossible to undo, and the detrimental effects would be extremely difficult to mitigate. -/

The "failing firm" doctrine

Up to now, I've been talking about the high road to merger -- securing approval by proving that the proposal would promote the public interest. There is also a low road-- under the failing firm doctrine, approval of an undesirable merger can be secured by proving that the alternatives are worse.

-/ See Direct Testimony of Dr. George Eads in the Northwest-National Merger Case, CAB Docket 23852, pp.6-7

It should be kept in mind that the failing company doctrine originated as a defense to antitrust suits, and comes into play only if it is established that the merger would be contrary to law absent the prospect of failure. It is not the policy of the Justice Department (or anyone else, to my knowledge) that an airline has to prove it is failing in order to secure approval of merger. There are frequent laments that this is the policy in effect now, but I believe these complaints miss the point. Our view of the law is that the failing firm doctrine is the only way an airline can get merger approval without proving net public benefits. It is the only way to secure approval of a merger proposal whose net impact is recognized to be detrimental to the public. Healthy, profitable firms certainly can merge - if they prove that their merger will benefit the public.

This leads to another common misconception about the failing firm defense - a misunderstanding of its purpose. The doctrine is not so much out of sympathy for the firm in difficulty as it is a practical effort to minimize damage to the public from business failure.

The reasoning of the failing firm defense is that although the merger will have an adverse impact upon the public interest, those adverse consequences will do less damage to the public interest than the failure of the firm, or the other alternatives available to prevent this failure. This is the most important point of the Supreme Court decisions which have dealt with the failing firm doctrine. -/

-/ See also United States Steel Corporation v. Federal Trade Commission, 426 F. 2d. 592 (1970); United States v. International Shoe Corporation, 280 U. S. 229, 301, 302 (); Citizen Publishing Company v. United States, 394 U.S. 131 (1969); United-Capital Merger Case, 33 CAB 307 (1961); Northwest Airlines, Inc. v. CAB, 303F. 2d 395, 397 (1962).

The rationale of the failing firm defense requires those who seek to invoke it to prove that the merger is the "least anticompetitive alternative." As the Supreme Court has noted, if a merger is consummated despite the existence of less anticompetitive alternatives, "the benefits of competition, acknowledged by Congress, would be sacrificed needlessly." -/

One distinction should be drawn before we leave the subject of failing firms. In a number of cases, the Board has approved mergers because of the financial weakness of the acquired firm, without making the findings which would be required to support the application of the failing firm doctrine. To my knowledge, however, these have been cases in which the Board also did not find competitive problems which would otherwise bar the merger. Thus, these cases were not "failing firm" cases, but really cases where the Board found that the merger promoted the public interest. -/

II. Application of the Federal Aviation Act to Airline Merger Cases

In order to protect the public interest, the Act requires the Board to take cognizance of the policies of the antitrust laws and the analytical techniques developed and used by the courts in applying those laws. -/ In merger cases, the pertinent statute is Section 7

-/ United States v. Third National Bank in Nashville, 390 U.S. 171, 189 (1967); see also Thill Securities Corp. v. New York Stock Exchange, 433 F. 2d. 264, 270 (7th Cir. 1971), cert. denied, 401 U.S. 994.

-/ Northwest Airline, Inc. v. CAB, 303 F. 2d. 395, 397 (1962).

-/ Eastern-Colonial Merger Case, 18 C.A.B. 781, 784-785 (1954), 23 C.A.B. 500 (1956); Braniff-Mid-Continent Merger Case, 15 C.A.B. 708 (1952); Delta-Chicago & Southern Merger Case, 16 C.A.B. 647 (1953); Delta-Northeast Merger Case, Docket 23315, Orders 72-5-73, 72-5-74 (1972).

-/ United Airlines Transport Corporation - Acquisition of Western Air Express Corp., 1 C.A.A. 739, 741 (1940).

of the Clayton Act, and the appropriate analytical techniques are the same as are used in the application of Section 7.

This does not mean that the Board is required to determine whether a proposed merger would violate the Clayton Act; rather the Board is to "make findings related to the pertinent anti-trust policies, draw conclusions from the findings, and weigh these conclusions along with other important public interest considerations." -/ Adverse antitrust findings are not conclusive, as they might be in a Clayton Act case; they and the other detriments are to be weighed against the benefits of the transaction to ascertain the public interest. Thus, the Board might disapprove a merger with less than grave anti-competitive consequences if the merger would bring few benefits, or approve a badly needed merger despite substantial anticompetitive consequences. -/

Even if the courts did not specifically require the use of analytical techniques developed in antitrust cases, the use of conventional antitrust analysis is quite appropriate in regulatory proceedings because

the basic goal of direct governmental regulation through administrative bodies and the goal of indirect regulation in the form of antitrust law is the same --to achieve the most efficient allocation of resources possible. -/

-/ Northern Natural Gas Co. v. Federal Power Commission, 399 F. 2d. 953, 961 (D.C. Cir. 1968) (Citations omitted.).

-/ See, inter alia, Denver & Rio Grande Railway Co. v. United States, 387 U.S. 485, 492-493 (1967); Federal Maritime Commission v. Svenska Amerika Linien, supra, 243-246; Northern Natural Gas Co. v. Federal Power Commission, supra, 958-961.

-/ Northern Natural Gas Co. v. Federal Power Commission, supra, at 959.

In order to define the competitive detriments of a transaction, the Board must look to the effects in the various markets which would be affected. Markets are defined in terms of the line of commerce (referred to as the product market) and the section of the country (referred to as the geographic market). Although there may be specific city pairs or regions where non-trunk carriers compete with trunks and should be included in the market for antitrust purposes, trunk airlines compete mostly with each other, and the product market for analyzing a merger between trunks is generally considered to be composed only of the trunklines. In a merger between a trunk and a non-trunk the competitive impact would have to be analyzed both in trunk markets and the appropriate non-trunk markets.

There is also general agreement that airline mergers should be analyzed in city-pair, regional and national geographic markets, although there is some difference of opinion as to the significance of these various types of markets._/

One word of caution is in order: there can be markets within markets, in both the product and geographic sense, and it may be reasonable to examine a merger in terms of several different markets, with some of the markets in other market. _/ The competitive inquiry should not focus on rigid definitions of markets, but rather the likely competitive consequences in as many relevant markets as are meaningful, based upon the economic facts in the particular part of the air transportation industry which is involved. The complexity of market analysis leaves much room for merger applicants to rely on sleight-of-hand: they can always point to another decision in which the Board examined a given market, argue that their application does not damage competition in that market, and ignore markets where there are

_/ See Joint Brief of the Applicants to the Civil Aeronautics Board in the American-Western Merger Case, Docket 22916, and the Brief of the Department of Justice in the same case.

_/ Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962).

damaging effects. It should be kept that there are a number of possible markets, and an anticompetitive impact in any of them must be taken into account.

There is a variety of techniques available for evaluating competitive impact in city-pair markets. City pairs in which the merger would reduce the number of competitors should be identified, and the severity of the impact pinned down as much as possible. This can be done by looking at the market share of the merged firm, and using it as an index of its ability to dominate the market. Competitive advantages which may arise from backup traffic or high identity at particular points should be identified. The magnitude of the affected city pairs should be quantified in some way, such as gross revenues or revenue passenger miles. The city pairs can be categorized according to the likely market effect, and their magnitudes within each category can be aggregated to gain a rough idea of the magnitude of the total impact. We believe it is important to compare the city pairs in which anticompetitive results would follow merger with the city pairs in which service benefits could be expected, although we recognize that such comparisons can rarely if ever be precise.

Less attention has focused on competitive impact in particular regions of the country, although there are several reasons it may sometimes be helpful to group several city pairs together for analytical purposes. Examples of regional markets would be particular groups of city pairs radiating out of a single point or a group of points, or an entire section of the country.

There is little serious dispute that trunk airline mergers should also be analyzed in terms of a national market. This national market is not equivalent to the national market for automobiles, where the same firms compete with each other in all parts of the country. But

even trunks which do not compete with each other in any city pairs are in some senses competitors in the national market. The impact of decisions such as what seating configuration to offer, what type of advertising campaign to conduct, and what type of aircraft to buy tends to spread throughout the industry even though the particular decision may have been motivated initially by a desire to meet a specific competitive threat encountered on only a few routes. In fact, many of the most vital decisions as to cost allocation, competitive effort and operational planning are made on a national or regional basis.

What are the possible anticompetitive results of a merger in the context of a national market? Perhaps the most important is concentration of economic power in commercial decision making. As I have noted, the Supreme Court has made clear that the presence of comprehensive economic regulation in an industry does not eliminate, but increases, the significance of economic concentration. _/ The trunk airline industry is characterized by a small and historically declining number of firms, with no entry by new firms. The trunk airline industry is more concentrated than most American industries. _/

-/ United States v. Philadelphia National Bank, supra, at 368.

-/ There are presently ten domestic trunk airlines (assuming consummation of the Delta-Northeast merger); the largest four firms have about seventy percent of the business, and the largest six about eighty percent. See Briefs of the Department of Justice in the American-Western Merger Case, Docket 22916, (Brief to Examiner, pp.15-17) and the National-Northwest Merger Case, Docket 23852, (Brief to Board, pp.30).

Perhaps more significantly, as will be discussed later, the industry appears to be more concentrated than it would be if there were no economic regulation.

As the examiner noted in the National-Northwest proceeding, concentration of this magnitude "can give rise to a number of well recognized evils,"_/_ and some of them appear to be present in the airline industry. It is not clear to what degree existing concentration has deadened incentives for commercial and technical innovation and distorted resource allocation, but one thing is clear: the industry is sufficiently concentrated that an increase in concentration through merger requires ample justification.

Another adverse impact which can come from merger is a distortion of competitive relationships among airlines which can arise from differing size. It is clear that, other things being equal, larger airlines have advantages due to size. These include the ability to support traffic in one market with backup traffic from another related market, the greater public familiarity of larger enterprises; an abstract feeling that in the words of Northwest Airlines "bigness is goodness;" advantages from advertising on a larger scale; and the fact that a carrier with more traffic at a given point can provide more services, sales and promotion at that point._/

-/ Recommended Decision of Examiner Park, supra, p. 30

-/ The advantages of size have long been recognized by the Board in deciding merger cases. American Airlines Acquisition of Mid-Continent Airlines, 7 C.A.B. 365,387-89 (1946). See "balance doctrine" cases cited in Brief of the Department of Justice to the Hearing Examiner, American-Western Merger Case, Docket 22916, p.17.

All of these factors create competitive advantages whether or not there is any difference in service to the public. In fact, very seldom do they include improved service to the public or greater efficiency. In the context of CAB price and entry regulation, the primary result of the advantages of size is to confer upon larger firms a degree of "market power" in that their actions are somewhat insulated from the pressure of their competitors' actions, and they have a degree of power over those competitors' actions. The number of trunk airlines is so small, and the imbalance in size distribution is such, that the Department has expressed concern at the market power which would result from the combination of two smaller trunks, National and Northwest. A fortiori, this concern also applies to the merger of larger trunklines.

Two similar detriments from the disappearance of a competitor are the loss of "yardstick competition" which can arise from comparisons between carriers which do not directly compete, and the loss of a divergent voice in the regulatory process, and consequently a limitation on the number of alternative actions, viewpoints and information presented to the regulatory agency for consideration.

/ Recommended Decision of Hearing Examiner Ralph L. Wiser, p. 11, in the Bonanza-Pacific-West Coast Merger Case, Docket 18996, adopted by the Board in its opinion in Order E-26625, p.4.

/ The District of Columbia Circuit Court of Appeals has warned that the quality of regulatory decisions can be lessened if regulated firms limit the number of alternatives presented to the regulatory agency. Northern Natural Gas Co. v. Federal Power Commission, supra, at 973.

The Supreme Court's decision in the El Paso Natural Gas case shows that a merger's impact on potential competition weighs importantly, even in a regulated industry.-/ In the trunk airline industry, where entry is essentially closed to new firms, potential competition among existing firms on particular routes is more important than it would be in an industry with unregulated entry. Unlike the unregulated competitor, a trunk airline today can be confident that new entrants into its markets will not come suddenly or without warning, and perhaps more importantly, that such new entrants will come from the ranks of the very few existing firms whose route systems have a viable connection with the subject markets.

It is frequently remarked that there are usually several applicants in new route award cases. It does not follow, however, that the disappearance of a potential competitor is necessarily unimportant. Because differing route characteristics make some applicants more logical recipients of new authority than others, and rule out some applicants the value of a potential competitor needs to be evaluated in each specific instance.

Since I promised a few words on the comparative roles of competition and regulation, I will make two brief comments on that subject. I will leave detailed commentary on the economics of the industry to the econonists, but I think it is appropriate to point out that the economic characteristics of the airline industry are such that the Federal Aviation Act's relatively heavy reliance on competition as opposed to

-/ United States v. El Paso Natural Gas Co., 376 U.S. 651 (1964).

regulation is quite well suited to the industry. In the recent trunk-line merger proceedings, a great deal of economic expertise has been brought to bear upon the economics of the airline industry, but the net result has been a relatively simple conclusion: within the size range represented by the trunk airlines, there are no economies of scale._/ With respect to trunk air carriers, the proposition that there are no economies of scale does not appear to have been subject to serious dispute in the economic literature or in recent merger proceedings, which examined the area thoroughly. Considerably less attention has been paid to the question of whether there are economies of scale for smaller air carriers, but there are some indications that all economies of scale are realized by the local service carriers, and perhaps by firms with only a handfull of aircraft._/ In the absence of government economic regulation, it appears that there would be very few barriers to entry other than the cost of meeting applicable safety standards. Consequently, the primary barrier to entry in the regulated industry is the requirement of a certificate of convenience and necessity. Most economists who have studied the question have concluded that the inherent economics of the industry are not such that destructive competition could be expected in the absence of economic regulation, and they

_/ See Recommended Decision of Examiner William J. Madden in the American-Western Merger Case, Appendix D, Docket 22916; Recommended Decision of Examiner Robert L. Park, supra, Appendix G.

_/ Testimony of Dr. William A. Jordan, American-Western Merger Case, CAB Docket 22916, Exh. No. DJ-RT-1, p.4; Testimony of Dr. George Eads, Northwest-National Merger Case, CAB Docket 23852, Tr. , G. Eads, The Local Service Airline Experiment (1972), pp. 72-74.

question whether there is any need for economic regulation in the first place. _/

The absence of economies of scale or other barriers to entry and the apparent absence of opportunities for profitable predation indicate that the trunk airline industry would probably be reasonably competitive and efficient without economic regulation. Accordingly, the usual merger policies applicable to nonregulated firms would appear to be appropriate unless economic regulation creates conditions which require departure from that policy.

The impact of regulation upon concentration in the airline industry, largely explained by the work of Bill Jordan who was here last week, is an important element in understanding the significance of regulation in that industry. Dr. Jordan's testimony for the Department of Justice in the American-Western case pointed out that if there were no regulation, there would be far less interest in airline mergers, since the asset the acquiring firm is most interested in is the certificate authority of the acquired firm. The results of his investigation of the California intrastate carriers during a period of virtually no economic regulation strike a startling contrast with the history of regulated airlines: none of the unregulated firms went out of business through merger, but the exit of carriers certificated by CAB has always been through merger. In fact, the route authority of regulated air carriers is a valuable

_/ See sources cited by A. Kahn, The Economics of Regulation, pp. 219-220.

_/ See Testimony of William A. Jordan, supra; W. Jordan, Airline Regulation in America; Annual Report of the Council of Economic Advisers, February 1971, pp. 128-130.

asset which they would not have in the absence of regulation. It is not surprising that they never leave business without getting something in return for this asset.

Economic regulation in this industry, as in other "inherently competitive" industries appears, then, to have created a powerful incentive for concentration. This influence appears to have been reinforced, moreover, by CAB's decisions with respect to entry. Although existing firms have been placed in competition with each other to an increasing degree, no new firms have joined their ranks, and with the elimination of firms through merger, the number of firms in the trunk and local service industries has steadily declined since 1938, when economic regulation in its present form was instituted. We have stated that this "closed entry" situation must be taken into account in setting merger policy, and requires that the effects of the loss of a competitor must be closely scrutinized.

In conclusion, I can summarize these remarks as follows: existing law places a high value on competition, and requires that airline mergers be approved only very cautiously- The economics of the airline industry are such that existing law serves the public interest reasonably well.

1073-32898

ONE AIRLINE'S VIEW OF MERGERS

Presented At The

1972 Summer Workshop On

"AIR TRANSPORTATION SYSTEMS ANALYSIS AND ECONOMICS"

(Sponsored by Massachusetts Institute of Technology
and National Aeronautics and Space Administration)

Waterville Valley, New Hampshire

By Edwin I. Colodny
Executive Vice President
Legal Affairs & Marketing Services
Allegheny Airlines, Inc.
Washington, D. C.

July 19, 1972

It is a privilege to have this opportunity to appear before the M.I.T./NASA workshop in the company of the distinguished lecturers on your program. My reason for being here is that Allegheny has been involved in airline mergers.

There was little, if any merger activity in the six years following the United/Capital merger in 1961. But it has been a very active period in the past five years. Since 1967, there have been six mergers approved by the CAB:

Frontier/Central - now Frontier

Bonanza/West Coast/Pacific - now Hughes Air West

Allegheny/Lake Central - now Allegheny

American/Trans Caribbean - now American

Allegheny/Mohawk - now Allegheny

Delta/Northeast - successor to Northwest/Northeast

Seven airlines have disappeared in the process. If the pending

American/Western and Northwest/National mergers are approved, two more carriers will go into history.

As of today there are eleven trunklines - soon to be ten - or perhaps only eight.

And there are eight local service or regional carriers.

What causes this periodic tendency for industry restructuring through merger? In its simplest terms, it is the opportunity to expand ones marketing area and increase productivity by a quantum amount without the necessity of following the arduous, tortuous path required to obtain certificates of public convenience and necessity under section 401 of the Federal Aviation Act.

Routes - this is the why of mergers - combined with one other critical ingredient: a willing partner to the agreement. With the exception of the currently pending American/Western and Northwest/National agreements, all significant mergers have involved a relatively strong carrier and a relatively weak carrier in financial difficulty. In the latter case, one might question whether the partner was truly "willing" since the marriage could more aptly be characterized as a "shotgun affair" dictated by the financial facts of life. Yet in most instances, the merger partners have had a strong affinity for each other because of the complimentary nature of their route structures. Certainly this has been the case in the two Allegheny mergers since 1968 - Lake Central and Mohawk.

Allegheny's growth from a small carrier to the 6th largest domestic carrier as measured by passenger boardings is the product of several factors:

- 1) its location in the most populated section of the U.S.
- 2) an aggressive, continuing effort to expand to profitable markets via the certification route under section 401
- 3) a program to harness the traffic potential of smaller cities through use of the "Allegheny Commuter" concept
- 4) expansion through merger
- 5) a financial program to support continuous, rapid growth

In the limited time available, I will comment on the role mergers have played in Allegheny's development, and some of the significant problem areas associated with mergers.

I. BACKGROUND OF ALLEGHENY'S MERGERS WITH LAKE CENTRAL AND MOHAWK

In the early 1960's, Allegheny began thinking in terms of its long-range future. At that time our system had severe limitations - the Middle Atlantic States, with Boston and Washington, D. C. on the east, and Pittsburgh, Cleveland and Detroit on the west. A rather restricted area for a jet age route system, further complicated by route restrictions prohibiting competition with trunklines.

We developed a program to obtain new routes from the CAB. We also made a study of what mergers might do for Allegheny. We looked at the potential of the Mohawk, Piedmont and Lake Central systems. Lake Central made the best choice for several reasons:

- 1) its routes to the west of Allegheny's system would give Allegheny access to several major cities - Chicago, St. Louis, Indianapolis, Dayton, Louisville, Cincinnati and Columbus
- 2) Lake Central and Allegheny had common cities at Washington, D. C., Baltimore, Buffalo, Detroit, Cleveland and Pittsburgh
- 3) Lake Central's management had concluded that Lake Central's financial future was shaky and was willing to consider a merger
- 4) Allegheny was more than twice the size of Lake Central, thus assuring that Allegheny's personnel policies and collective bargaining agreements would prevail

In the Mohawk situation, there were some like factors to the Lake Central situation:

- 1) Mohawk would give Allegheny access to Minneapolis, Rochester, Syracuse and Montreal
- 2) 19 cities were common to both carriers including such important points as Boston, Hartford, Providence, New York, Albany, Philadelphia, Washington, D. C., Pittsburgh, Buffalo, Toronto, Cleveland, Detroit and Chicago

3) Allegheny was about twice the size of Mohawk.

There were, however, some major differences between the Lake Central and Mohawk situations:

- 1) Mohawk had obtained nonstop rights in most of its markets within the system, such as New York to Rochester/Buffalo, Cleveland to Albany/Hartford, and Buffalo-Boston. By contrast, Lake Central in 1968 had a highly restricted route system requiring intermediate stops between most of its larger cities. To develop Lake Central's market potential required an aggressive program seeking CAB approval for nonstop rights in such markets as Chicago-Pittsburgh, Indianapolis-New York and St. Louis-Pittsburgh in order to develop the flow potential of the merged Allegheny/Lake Central system. We were fortunate that our program coincided with a positive policy of route strengthening at the CAB, prior to the recession of 1970. We were successful in large part, except for opening up Philadelphia. Also, we were dealing with monopoly markets (except for Pittsburgh-Chicago). Thus we could not really integrate the Allegheny-Lake Central systems for about 18 months after the merger.

Within six weeks of merger with Mohawk, Allegheny was in a position to schedule through flights between the Allegheny and Mohawk systems, on an economical basis, because of the

compatibility of routes at the common terminals of Buffalo, Cleveland and Detroit - without asking for new CAB authority.

- 2) Mohawk was seriously in default on its \$78 million of senior and subordinated debt, aircraft leases, as well as delinquent in accounts payable. It was, frankly, on the verge of bankruptcy. It had suffered a five month pilot strike. At the end of the 1st quarter of 1972, it had about \$18 million due but unpaid on loans and leases. Mohawk's net stockholder equity had dropped from \$16 million in 1966 to minus \$8 in 1971 - a \$24 million swing.

In the Lake Central situation Allegheny simply assumed all of Lake Central's outstanding debt obligations.

Not so in the Mohawk situation. It was necessary for the long term subordinated creditors to accept the fact that their investment could not be assumed by Allegheny. Thus the merger agreement provided for an exchange of Allegheny convertible preferred stock with warrants for \$28 million of Mohawk subordinated notes and debentures.

In addition, the Mohawk senior debt had to agree to (a) a moratorium of all principal and interest payments until merger completion; (b) refunding of the debt as part of Allegheny's senior indebtedness and compatible with the merged corporation's debt servicing ability based upon profit and loss and cash flow projections for the combined operations.

CL

CL

Allegheny's senior debt also had to accept some modifications, in the form of a rescheduling of a small portion of principal payments.

3) The accounting treatment was quite different.

The Lake Central merger was handled as a "pooling of assets", which meant that all of Lake Central's assets and liabilities were included in a consolidated balance sheet. Thus, Allegheny accepted the book values of the Lake Central aircraft fleet without adjustment. One of the negative aspects of the Lake Central merger had been the restricted utility of the 25-passenger NORD 262 aircraft, 12 in all, which Lake Central had purchased in 1965. Allegheny retired these aircraft in 1969, along with Allegheny's F-27 fleet - and at that time wrote down the net investment in these aircraft by \$4.3 million, which was charged against earnings.

Allegheny desired to protect against a similar situation in the Mohawk merger as it related to Mohawk's fleet of 17 FH-227 propeller aircraft. We had concluded that the useful life of the FH-227 was limited in the post-merger period because of economics, and would be the first aircraft type to be phased out post-merger. Accordingly, as a condition to the effectiveness of the merger, Mohawk was required to write-down the investment in FH-227's by at least \$9.4 million.

In addition, Allegheny was paying approximately \$6.3 million as route acquisition costs,^{1/} which are to be amortized over a 40-year period.

Thus Allegheny was required to account for the merger as a purchase.

I would like to comment on a few related aspects of mergers:

- 1) Management - If one thing is clear it is that there can be only one surviving top management. It is not practical to expect two carriers to meld their senior management on an equal basis. In both of our mergers, Allegheny management has remained, with relatively few additions from Lake Central or Mohawk. One need only recall the debacle at Air West created with three equal partners trying to run the merged operation until rescued by Howard Hughes. At the Board of Directors level, Allegheny took five of Mohawk's 12 directors.

^{1/} Route acquisition costs - amount of all Mohawk obligations assumed by Allegheny, plus the value of the common stock, stock purchase warrants, value of preferred stock and stock purchase warrants issued, less the fair value of the assets acquired from Mohawk at merger date.

Yet at the same time while the sword of Damocles hangs over the heads of the carrier, being absorbed, their management must be kept reasonably intact to run the airline - a delicate situation. Mohawk did lose some officers while the case was at the CAB.

- 2) Personnel - The ultimate success of a merger is very much dependent on the rank and file employee groups merging in the fullest sense of the word. Pilots, mechanics, hostesses and ground services personnel are called upon to accept strangers as equals. This means seniority integration on a fair and equal basis, and a host of other considerations affecting individuals such as shift assignments, days off, and so on.

The CAB has an elaborate set of conditions attached to merger approvals. These labor protective provisions are designed to minimize the impact of mergers on employees and to provide for dismissal and displacement allowances and real estate protection.

Allegheny has had a minimum of difficulty with its personnel. Prior to the merger, pilots, mechanics, hostesses, ground services and reservation personnel of both companies had all agreed on seniority integration. As a matter of fact, pilot training commenced eleven weeks prior

to the merger.

For the groups organized under collective bargaining agreements, Allegheny's contracts were the surviving agreements. A challenge in the federal courts to this position was made by the Teamsters in the Lake Central merger. The Teamsters represented the mechanics at Lake Central, and IAM represented the Allegheny personnel. The federal court rejected the challenge, upholding the right of the majority group to have its labor agreement survive and supercede the agreement of the minority group.

Likewise, in a situation where Lake Central's ground personnel were organized and Allegheny's were not, we successfully upheld the position that Lake Central's labor agreement could not be imposed on the unorganized Allegheny personnel. The Railway Labor Act, which governs collective bargaining in the air transport industry, requires that representation be on the basis of the wishes of a majority of the craft and class. Unlike the situation under the National Labor Relations Act, minority unions are not recognized. Consequently, Allegheny's employees group, which had chosen to remain unorganized could not have the representation of Lake Central's union imposed upon it.

In the Allegheny/Mohawk merger, we had a rather unique situation, where ground services and reservations of both carriers were not organized. To meet the Labor Protective Provision requirement of fair and equitable seniority integration, we established a procedure for the agents of each company to select their own representatives for purposes of negotiating an agreement. Little did we realize the long, drawn-out negotiations which were to follow. Some of the Allegheny personnel were initially inclined toward the position that since Mohawk was in trouble, and Allegheny was the surviving carrier, Mohawk personnel should not be given full credit for their Mohawk employment time. One position was that the Mohawk people should go to the bottom of the seniority list, particularly at the common stations, and be the first laid-off. Because of my position as the senior Allegheny officer responsible for customer service functions, I found it necessary to hold meetings at several of our large stations, such as Boston, where both carriers operated, to respond and explain what was required. After several weeks of meetings, the agent representatives finally reached a fair and equitable agreement - and it has proven so in actual experience. It was significant that former Lake Central personnel were very helpful

in bringing about this agreement.

Allegheny personnel have an outstanding record in achieving harmonious employee integration in both the Lake Central and Mohawk mergers. A large part of the credit also goes to Lake Central and Mohawk employees. It is in sharp contrast to the employee frictions which have arisen in most other mergers, and most recently in the American/Western and Northwest/National mergers, which have been marked by outright opposition including lawsuits brought by certain employee groups. Based on the record so far in those two cases, it is fair to predict a lengthy period of unstable labor relations at both companies should the mergers be approved.

3) Merging the Operations

While all the esoteric planning was going forward to achieve approval by the CAB, the President, stockholders and financial groups, those who are charged with the day to day operation of the airline were moving along at an accelerated pace. Following the merger agreement in April, 1971, Allegheny established an internal committee called the "Operations Department Merger Committee" to oversee the nuts and bolts aspects of the merger. Target date for accomplishing the merger was 9 months - February 1, 1972. That period was utilized to establish the post-merger systems,

manuals, training programs, marketing concept facilities planning, personnel programs, and a hundred other critical policies. Again, to assure a relatively stable operation, in most cases Allegheny's procedures were utilized, to avoid confusion and the necessity of resolving close issues.

What happened after April 6, 1972, when the CAB and the President approved the Allegheny/Mohawk merger?

- five days later, the Boards of Directors met to take final action approving the merger
- the next day, April 12th, we legally merged
- six weeks later - June 1st, all five Mohawk crew bases had been consolidated with Allegheny's three bases at Boston, Pittsburgh and Washington, D. C., all FH-227 aircraft had been retired from scheduled service, four additional BAC-111 aircraft had been added to the fleet, and a new schedule marrying the two systems was being flown
- the month of June saw 870,000 passengers board Allegheny - and producing a very profitable operation

I shall conclude these remarks with a personal observation: the ability to merge air carriers under the provisions of the Federal Aviation Act contributes to the development of a sound air transport system. It does this by permitting the replacement of weak links with stronger, and

without government being the originating force. The government can react to but not sponsor mergers. After all, there is nothing sacred about the grandfather carriers - they "happened". The same can be said of the original local service carrier certifications. Under our private enterprise concepts, there is more good than bad in the ability of individuals to explore and propose those changes which the government regulators should consider in developing a dynamic transport system for the future.

* * *

1173-32899

July 21, 1972

International Air Transport Policy
Charles Butler/CAB

In international matters, the Civil Aeronautics Board gives advice and assists the State Department in negotiating. Mr. Butler will discuss the Board's policies and guidelines and, in particular, how they relate to the President's Policy Statement and its interpretation by the DOT.

1. In the time afforded me, I would like to touch briefly on a few points concerning international air transportation, and thereupon, try to answer any questions you may have for me.

2. I first like to observe that the business of international air transportation in the world at large reflects the policies and approaches of many governments. Each has its own views on how the flag air services should be instrumented, the purposes to be served, the amount of competition desired or permitted, and the degree of governmental involvement in the business. The United States has one view of the matter, the Europeans have their view, and the Latin Americans have another, and in-between come the smaller countries that may not have their own airline but do provide important tourism destinations. The varied promotional and regulatory environment described makes the business of international air transportation both predictable and non-predict-

able, depending on how one wanted to read the situation.

3. The political environment for international air transportation insofar as it concerns the United States alone is shaped by the roles of the Civil Aeronautics Board (CAB), a part of the Legislative Branch, and of the Executive Branch. The CAB is, by law, responsible for the economic regulation of the nation's air transport industry including the domestic and international sectors. In this capacity, it grants certificates of convenience and necessity to U.S. air carriers for domestic and international operations and licenses to foreign air carriers for operations to the United States, among other economic functions. The Board also has a statutory mandate to promote the air transport industry, not just to regulate it. In my mind, the Board's mission to both promote and regulate has not compromised one function at the expense of the other, but rather it has served the nation well, judging by the record.

4. The grant of certificates to U.S. air carriers for international operations and of licenses to foreign air carriers for operations to the United States has to be approved by the President. In economic proceedings of the Board, the Department of Transportation (DOT), and any agency or person, are privileged to present their views to the Board. While the Act is not altogether specific on agency roles, there is an obvious rationale for a

Presidential responsibility in matters affecting our relations with other countries. It is equally desirable to have the views of the DOT and others in aviation proceedings in the interest of overall transport planning and policy guidance. Otherwise considered, there is also purpose in the Congress' desire to entrust strictly economic regulatory responsibilities to an independent agency, namely, the Civil Aeronautics Board.

5. Turning to substantive economic matters, I made my view known recently on how we should go about trading aviation rights with other countries. It was essentially the Yankee idea that you get dollar for dollar, that you trade fair value for fair value. It is an equation which calls for balanced economic trade between the United States and the other country. If this has not always been the kind of economic position that the United States has adopted, it was the kind of position that we could ill afford not to adopt. We have unquestionably been too liberal or not very careful in some of our aviation trade dealings with other countries, giving too much for value received. We have bought too much in other instances, with the result that we have traded away what we did not have to. Whatever the explanation -- U.S. benevolence, etc. -- our aviation trade imbalances with other countries cannot be permitted to stand.

6. Belatedly, we have become very concerned of late with the trade terms of bilateral air transport agreements which put the United States at a decided trade disadvantage. Mr. Binder referred to one situation where something concrete has been proposed and something is being done about it. That is the Irish situation ... a very old matter, I hasten to add. For 25 years, we have tried to negotiate our way into Dublin without success. Air Lingus, the designated Irish trans-Atlantic carrier, serves Boston, Chicago, and New York in the United States and Dublin in Ireland. Our carriers serve Shannon, but not Dublin, which in our view gives the Irish carrier a competitive advantage. Air Lingus has been enjoying a 4 to 1 revenue advantage in the U.S.-Ireland market over our two U.S. carriers in the market, namely, PAA and TWA. Under a Board order which was issued this summer, and which has now been stayed by the White House for the balance of the year, the right of Air Lingus to serve New York would be cancelled. It will continue to have the right to serve Boston and Chicago.

7. The United States has requested capacity talks with the Netherlands. Our figures show that the Dutch have been carrying approximately 60 per cent over their own homeland traffic between the United States and The Netherlands. The Netherlands has been simply acting as a traffic gathering or funnelling point, and as an "artificial" stopover point. Relevantly, the Amsterdam Chamber

of Commerce provides a cost-free day in Amsterdam to any passenger who wants to stop over there. A passenger who otherwise would be a transiting passenger becomes under the circumstances a stopover passenger, with the further result that the origin traffic which can be claimed is inflated.

7A. In terms of a strictly U.S.- Netherlands air passenger market, the 12 weekly frequencies operated by KLM between Chicago and Amsterdam cannot be justified in terms of the traffic that the Netherlands is capable of generating. There is one U.S. air carrier flying out of Chicago to Europe, compared to 10 foreign air carrier flying out of Chicago to Europe, compared to 10 foreign air carriers serving Chicago, but this fact doesn't alter the picture. The one U.S. air carrier has one nonstop a day, and that goes to London. The artificial stopover is just an added factor in the problem. The capacity talks with the Netherlands are slated to take place in the fall.

8. We are currently faced with a capacity problem involving another European country, specifically, the United Kingdom. Relevantly, the British Government recently issued an order disapproving National Airlines' increase in capacity in its service between Miami and London from four 747 and three DC-8 frequencies weekly to a daily 747 service. In retaliation, the United States issued an order against BOAC, the British carrier

1

serving the London-Miami market, requiring it to file schedules with the Board for approval. This action was pursuant to Part 213 of the Board's Economic Regulations, which came into effect in 1970. The regulation has been used by the United States, so far, against Australian, Argentine, and Spanish carriers, and now against BOAC.

9. The British action against National Airlines is inconsistent with the spirit and letter of the bilateral air transport agreement signed by the two countries at Bermuda in 1946. That agreement was the first to reflect what has become known as the Bermuda capacity principles and what has become an integral part of all the agreements we have signed since. In essence, these principles describe the discretion of airline management to schedule the capacity it deems necessary in the light of its market judgment. If after a reasonable period of time, the other party to the agreement believes the new capacity is excessive, it may ask for consultations leading to a capacity adjustment, but only after the market has first been allowed to test itself. In our current view, the British action against National Airlines is contrary to the terms of the agreement, and if it is allowed to stand, it would invite other countries to similarly move upon U.S. carrier operations.

10. In the overall United States-Europe air passenger market -- including scheduled and non-scheduled/charter movements -- we originate two-thirds of the traffic moving in the market. This figure has prevailed for a long time, in spite of the various efforts made to increase the flow of foreign visitors to the United States. Apart from this fact, our carriers are hauling only about 45 per cent of the total traffic in the market, a situation which has existed for the past several years. We were a little worse off in the early 1960's when in one year U.S. carriers carried only 35 per cent of the North Atlantic market, so that there has been some improvement over time. The situation describes, on the other hand, a continuing source of balance of payments problem and corresponding need to do something about it as the aviation negotiation table.

11. The Deputy Assistant Secretary of State for Economic Affairs stated in a recent speech in Washington that the United States must take into account the origin of traffic and the balance of payments impact in granting and exchanging air rights with other countries. I agree with him. The economic equation to be struck must go beyond a simple exchange of routes and a calculation of estimated U.S. carrier revenue. It must consider the volume of traffic that can be realistically generated by the other country and enjoyed by our carriers. The United States is dealt a heavy economic blow if the spending by travellers in the market

is all one way, that is, the other country gets all or most of the transportation revenue and visitor spending, and we have only served to supply the travellers.

12. By way of concluding my remarks, I'd like to focus briefly on the place of the charter, or supplemental, air carrier in the marketplace.

13. That the charter air carrier has a place in the sun goes without saying. This observation is easily conveyed by traffic statistics for the U.S. - Europe air passenger market. In 1963, a total of 2.5 million passengers were transported in either direction by commercial air carriers across the North Atlantic, including scheduled passengers and a small number of charter passengers. In 1970, the total stood at 8.5 million, including nearly 2.5 million charter passengers or about 25 per cent of the total. Put another way, in just seven years, the number of charter passengers in the North Atlantic market has grown to the point where in 1970 it equalled the combined total of scheduled and charter passengers carried in 1963. These statistics also serve to convey, I believe, the observation that the volume of scheduled traffic in the market has also expanded rapidly in the same period.

14. Charter travel with particular reference to ITC's -- inclusive tour charters -- have experienced a tremendous growth

in the intra-European air passenger market. Literally millions of people "charter" from northern European cities to the sunny resort areas in Spain, the Mediterranean, and North Africa. The development of the intra-European ITC market is the product of the last ten or so years. When it began, there was little or no scheduled air services connecting the cities in the north of Europe and the resorts in the south of Europe. The European air charter industry went to work and produced a service and not a need where none existed previously, with obvious success. It did not have to contend with a scheduled air transport industry, and that obviously solved or obviated a problem, depending on the way you look at it. This is a very different picture from the development of charter travel between the United States and Europe, where there was a going, scheduled industry in the market, established for many years.

15. The rapid growth in charter travel in the U.S. - Europe and intra-European air passenger markets is recognition of a strong public demand for low-cost vacation air travel. It is a demand which stated in another way is very price sensitive. It is also recognition of the willingness of potential travellers to pool their travel plans with others, that is, leave, travel, and return together. Otherwise described, we are talking about the bulk, group, or mass market ... however you want to call it.

We are also talking about the continuing growth of the pleasure travel market which is rapidly overtaking the business travel market as the main source of business for the carriers, and which we can expect to increase to dominant proportions in all international markets in the years ahead. It is already dominant in some markets, as may have been indicated.

16. The position of the Board on the value of charter services is well known, I believe. In a recent pronouncement on the subject, it had this to say:

" The Board is convinced that the time has come to recognize new concepts of charter air transportation, and that charter regulations should be framed in a manner which will promote rather than inhibit the public demand for bulk air transportation."

These words were expressed by the Board in its Order, 72-6-91, of 21 June 1972, in which it disapproved IATA Resolution 045 governing passenger charters.

17. The Statement on International Air Transportation Policy, made by the President in June 1970, calls upon this country to reach intergovernmental agreements with other countries with the objective of providing a stable political platform for international charter operations. As matters now stand, scheduled air services are covered by bilateral air transport agreements, but

the right to operate non-scheduled/charter air services is granted on a strictly unilateral basis. As a practical consequence, international charter operations are for the most part subject to a wide range of unilaterally imposed restrictions. The President's Policy Statement left open the question whether the intergovernmental agreements covering charter operations should be sought on a bilateral or multilateral basis.

18. The position of the Board is that the bilateral road is the most practical or realistic course of action to follow. We have participated with other agencies in the development of a model of a bilateral air charter agreement. Representatives of the Department of State and the Board have held talks with a few countries about signing a charter bilateral, but with inconclusive results. The "selling" effort continues.

19. The charter part of the Policy Statement speaks of the necessity of taking steps to prevent impairment of scheduled and of charter services. In this regard, there seems to be a difference of opinion between the Department of Transportation and the Board on just how we should go about determining or anticipating impairment. The view of the Board is that you cannot determine on a a priori basis how many people will be available for travel on scheduled services. I side with the Board in believing that the market place is the best judge of the number

of people needing scheduled services. Apart from saying this, let me say that I don't really know what is defined by the word "impairment" or at what point either type of service is allegedly impaired. Or what shouldn't be impaired. The Policy Statement furnishes only a pragmatic suggestion as to what constitutes impairment.

20. At such time as someone -- a carrier, that is -- feels "impaired" or thinks he will be, the Board is ready to listen to both sides of the argument. Many issues and factors would have to be considered ... the kinds of fares in the market, the ability of the management of the airline, the policies of the other country ... some quantitative in nature, others qualitative. In one sense, the subject of impairment is not new, but it is one that the Board has had to consider in almost every decision it has had to make over the many past years. The point to be made perhaps is that there are few decisions -- in government, at any rate -- which can be reached on a strictly mathematical or numbers basis. But, let me also quickly say that the Board has an open mind on the subject, and would be very receptive to any model planning approach that would facilitate its tasks.

20A. As a practical matter, however, we are obliged for the most part to utilize an incremental approach to our problem-

solving and decision-making needs, checking our heading at each step of the way and going on from there, with the hope that we end up where a realistic, comprehensive, long-range planning capability would take us, if we contemporarily had that kind of capability.

21. Returning to the case at hand, I don't think that we can determine on a regular basis what proportion of the market ought to be reserved for international scheduled air services. This is the position I have taken at the Board and that is the position given by the Board's General Counsel at recent Congressional hearings. I think that the issues involved are too complex and far-reaching and in the final analysis we must reach our decisions on the basis of reasoned judgments in large part. Any impairment formula could easily lead us into a system of market allocations, and that certainly would not afford a basis for healthy market growth. I might say here in passing that this is one reason the Board has not chosen to participate with the Department of State and the Department of Transportation in charter talks with the European Civil Aviation Conference (ECAC). The direction of such talks could only take us towards a plan for allocating the market, rather than a plan for developing it.

22. What both the charter, or supplemental, air carriers and the scheduled air carriers must face up to is, the continued need to promote their product -- to sell their service -- to innovate, to create opportunity. I don't suggest that merchandising in a highly competitive market is easy, but I do suggest that without imagination and innovation and work in the marketplace, the results do not favor the public in terms of low-cost transportation and efficient allocation of resources nor do they favor the carriers. I am not suggesting a laissez-faire market climate, rather I am suggesting that there would be nothing in it for anyone if we simply rested our oars and waited for the market to come our way.

23. This concludes my presentation.

24. Are there any questions.

Question - Should the use of U.S. manufactured airplanes by foreign carriers be considered when negotiating bilateral agreements?

Answer - No. They purchased the U.S. aircraft because it was the best aircraft and they got fair value in that exchange. They got a good economic aircraft. It doesn't become part of the operation of the bilateral agreement. On the other hand, the U.S. passenger who is going out

and spending his money overseas is a different matter. For example, if the foreign carriers are carrying 54% of the traffic, that is a negative flow of gold for the U.S.

Q. - Did you say KLM flies 12 times a week from Chicago to Amsterdam?

A. - That's right.

Q. - Does a U.S. carrier have the rights from Chicago to Amsterdam?

A. - We have the rights from any point in the U.S. to Amsterdam. Generally, the way we describe the routes is from the U.S. to the point in the foreign country and, if we can negotiate it, to a point beyond. We also try to obtain intermediate points if we can do it. The Dutch have rights in New York and Chicago, I don't think they have Boston, but they have rights into Miami out of Netherlands Antilles.

Q. - Is there any American carrier service out of Chicago to Amsterdam right now?

A. - There is no American carrier service anywhere except to London, and that's one flight a day during the summer time.

Q. - Out of Chicago?

- A. - Yes. There are 10 foreign carriers serving Chicago.
- Q. - Is that because we don't serve them or have we refused to serve them?
- A. - U.S. carriers have chosen not to serve. Now, I'm not suggesting that the KLM-Chicago service is out of line. I'm suggesting that one U.S. carrier operates from Chicago to Europe nonstop and there are ten foreign airlines out of Chicago to Europe - most of it a daily service. ILM has 12 flights a week. Under the principals of the bilateral agreement, we have to ask whether those flights are being scheduled to handle U.S. - Netherlands traffic?
- Q. - Don't any of those KLM flights stop in London?
- A. - No.
- Q. - They are all nonstop?
- A. - Yes, they're all nonstop. KLM had to give up their rights to intermediate points in order to get Chicago.
- Q. - Could I ask what the detriment is to the United States of carrier competitiveness in actually scheduling flights for passengers who are going to go from country A to country B, and then on to country C?
- A. - Well, generally speaking, it will have an unfavorable competitive effect on the efforts of the U.S. carriers

to provide service to country C. For example, if a U.S. carrier flies one plane from the U.S. to Greece, nonstop, and KLM offers one plane, one-stop service via Amsterdam between the U.S. and Greece -- and offers a free day in Amsterdam, as I mentioned before -- there is bound to be a sloughing-off of the traffic from the direct services between Greece and the U.S.

Q. - Isn't KLM going to be able to resurrect all these services that foreign carriers have got in past agreements from the U.S.?

A. - Not necessarily, I don't think. We paid the price for multiple designations in most of our agreements. KLM and the Netherlands have done very well in their transport agreement with the U.S. They have access to New York and Chicago. The Belgians would also tell you that the Dutch have done very well in their relations with the U.S. They are trying to do the same thing.

Q. - What does KLM offer to induce passengers to fly KLM?

A. - It's just a competitive service. It's just the same service, the same kind of airplane, it may be the same number of stewardesses, but it may be a different uniform. It's the same price for carriers.

- Q. - Do you mean there are more Americans traveling on KLM?
- A. - Many foreign nationals prefer to fly their own national airline. The Irish like to fly Irish Airlines; the Japanese like to fly on Japan Airlines; Americans, however, like to fly on foreign airlines.
- Q. - Don't the Japanese get a discount on their own airlines?
- A. - I'm not sure. Not legally, they don't.
- Q. - Do they get a discount in their own country?
- A. - Well, if they do, it's not legal. I know that this happens in a lot of countries. To get out of Prague, unless you fly with CSA you pay 100% more. To fly out on a U.S. carrier, if you're a Czech citizen you have a 100% exit tax. You don't pay that if you fly on CSA but you do pay it if you fly Pan Am.
- Q. - What would it take to suspend or cancel flights from or to the U.S.? In other words, does your Department have the power to cancel flights, or does it have to be a Board action? Take the Irish situation, for example.
- A. - It is a Board action and involves two-step action. First, the U.S. under the terms of the bilateral agreement gives notice of renunciation of part of the

bilateral agreement. That takes one year to run. A year ago in August the U.S. gave Ireland a notice to terminate part of the air transport agreement which gave them the rights to New York. The Department of State gave that notice. Then the CAB started a proceeding based on a show cause order as to why the Irish Airlines' rights to New York should not be withdrawn. The examiner has now recommended his decision and the Board has the case before it and will make its recommendation to the President for his final disposition. The rights were granted to the Irish by the Board pursuant to the air transport agreement. If the basic agreement is altered so that the rights to New York are no longer there, the Board will then take the steps to review whether the permission it granted pursuant to the agreement should not be withdrawn.

Q. - Is this a one year lag then?

A. - It can take 12 months and any agreement or part of an agreement can be denounced.

Q. - What kind of a response do you have for cases like the British action against National?

- We have a regulation called Part 213. We can require that schedules be filed for approval. Generally speaking, this is reserved as a means of retaliation. Where the United States carrier has had its operation restricted by a foreign government unilaterally, then the U.S. under Part 213 of the Board's regulations can issue an order requiring the carrier to file schedules for approval within 30 days. For example, with the Australians, the CAB refused to let them schedule their services of the 747's to the U.S. They had just taken delivery of the plane but couldn't schedule it to the U.S. There was the plane sitting there and they did not know what to do with it. That was rather effective from our standpoint.

Q. - So you do have a quick response mechanism?

A. - Yes. I was in London on the first of July talking with the British about this problem of National Airlines. Ten days later the Board came out with the first part of the order requiring BOAC to file schedules. The second shoe has yet to be dropped on what and what not might be approved.

Q. - National had very little time to comply?

A. - They had a few days, to comply.

The British order was to be effective on the 26th of June, was issued on the 19th, I think, and it required National to move down from a daily 747 to 4 days a week with a 747, and 3 days a week with a DC-8. Now, when we got in London on the 30th of June, Friday afternoon, we asked the British if they would at least suspend the application of the order until over the weekend because National was going to have to turn passengers away.

In other words, they had booked more passengers than a DC-8 can handle. The British refused. The first night that the order went into effect National operated the DC-8 and had to turn 60 passengers over to BOAC. The next night out of Miami, National had to turn over 100 passengers to BOAC because they couldn't accommodate those passengers already booked on National because the requirements reduced the size of the airplane. One of the figures we showed the British indicated that in June only 4 days out of the whole month could National have accommodated the passengers they actually carried on the narrow bodied aircraft. The other 26 days of the month they required something larger than the regular DC-8, the only other plane they had, to handle

the passengers. But this hasn't made any difference. I think the British are a little irked that National wouldn't accept the proposal by BOAC to pool on Miami-London and split the frequencies. National could have four 747's and BOAC would have three. They would have daily 747 service to London and everybody would be ahppy and there would be competitive equity. National declined the offer and said they were going to take a chance with going daily. National had a 90% increase in passengers over the previous year in the month of June. The load factor was 46%, not high, but when you have a 160% increase in capacity, a 46% load factor is good. In a 4,000 mile flight, a 35% load factor is about break-even, so they are not losing money. It is not an uneconomic operation. The facts show that BOAC's 707 operation can do as well against National's 747's. The place where BOAC broke down was, they were flying their 747's empty when they ran head to head with National. They just couldn't go with the 747's.

Q. - I would like to clarify a point that was made earlier. I would think that the Bermuda Agreement is a most misunderstood overworked agreement. Would you say that

this fact alone would justify any action by your agency? Is that a reason by itself for you to take any action you want to?

- A. - I don't think that it would be by itself. It would probably be part of a number of factors that would influence this particular decision. In trying to evaluate routes, you put down a number of factors that make up an economic exchange of routes. The number of passengers flying the route, the number of points that you get, and the markets that have been made available to you. But what has been suggested is that we have to crank in the idea of the benefits that are flowing to that foreign country not only from the number of passengers being made available which is normal, but in addition, the amount of outflow into that country of U.S. dollars because of the tourism. I agree with that. The tourism account in the U.S. is dreadful as far as balance of payments are concerned. We've got a National Tourism Resources Review Commission that's been working for a couple of years now trying to come up with some answers to how we redress the imbalance in the tourism account. And, as I understand it, they've come against a blank wall -- as everybody has.

Q. - A point of view, and I would like to clarify it, the Board's view and your expression of it is that you can't determine these bench-marks on charters and scheduled services ahead of time and I heard you say that the market should be allowed to work this out. How do you relate that general position to the kind of charter regulation that the Board has or would adopt? How much constraint can you put on the operation of the market if given that approach?

A. - I'm glad you asked that because that's a point I missed. The Board feels that as a regulatory body it is essential to proceed step by step. If you look over the history you will see a gradual liberalization of Board policies and Board regulations as far as charters are concerned. It has been a step by step process. I think that because we are unable to judge the potential impact of a given Board action, it is essential to take a step by step approach to regulation so that we can evaluate conditions after the first step and find out what the next step should be. Suppose the Board just wiped out all affinity requirements, no advance purchase, no limitations whatsoever on charters, that would be a rather substantial step and might be like

stepping off the 10th floor without an elevator. That long first step may do you damage that you can't correct in time, given the regulatory process that you have to go through. I think that it is rather essential that you look at regulations in a sensible, orderly fashion. We are set up at the CAB to regulate an industry, not to run an industry. We'd probably be the world's worst airline managers. We're not designed for that. That's what gives me some pause and problem with all the innovations the CAB is supposed to come up with that were suggested this morning. The airlines run themselves under a system of regulation. They are not utilities in the sense of having monopolies.

It is not possible to sit and analyze a situation today as far as charters are concerned. We cannot say that because this is the distribution of traffic that is now being carried on scheduled airlines we can predict that in 1975 this will be the relationship or should be the relationship between scheduled service and chartered transportation. You use the term "benchmark". I think that is a convenient term, but it still requires telling the Board that it should sit down and examine

the whole spectrum of North Atlantic traffic, determine how much of that is demand transportation, how much of it needs scheduled service, and then issue an order that says New York-London in the summer can have no less than 2 flights a day from New York; one flight a day from Los Angeles; one flight a day from Chicago, and all the rest are available for charter transportation. But, what basis do we have to do that? What factual probative evidence would we have in a proceeding like that? How could we sit and say this factor should be taken into account, this one should not? Can't we get a better answer by letting the market go at it?

- Q. - You are not letting the market go at it, that is the problem. It is obvious that it will continue as it has for years. But, the Board's star position, in my judgement, constrains the potential use of charter transportation substantially. If your remarks are any sign, the new charter regulations will also constrain the use of that authority to some degree. Granted that you like to move in comfortable steps so that you don't over-reach, but I could make the argument that the Board is much too conservative, that the steps are

too small, that the constraint should be loosened much more rapidly. At that point the question is what criteria do you use or does anybody use to choose the amount of constraint? I find no comfort in looking at criteria with the approach that you will do it on a step-by-step basis so that you always feel that you have the situation under control. For all anybody knows about market pressure and market demands for this kind of travel maybe we could be moving at 3 times the rate. Because we don't have any benchmark to know where we are going with this exercise there is no way of telling whether we are too slow.

- A. - I guess the inclination that I've seen in the Board so far is to wait until we get to the point where we are looking at impairment, or possibly begin to see it because of a complaint that is filed by either the scheduled carrier or by the charter operators, if there are two separate classes by the time that comes, and determine whether or not the impairment has taken place. For example, we don't try to determine in advance what the appropriate level of schedule service should be under bilateral agreement. We say that we must do an ex post facto review. Let the carrier

schedule it and then after a reasonable period, review the experience. If the review shows that the carrier has overscheduled itself, we will make an adjustment. We don't determine things in advance, except for subsidy. The subsidy levels, I think, are the only area where the Board has said, two flights a day in each direction is the minimum required for a subsidy operation. When you get in to other aspects of the Board's work like adequacy of service for instance, the Board doesn't determine that on an a priori basis. Most of the adequacy of service cases at the Board have been very complicated. The main feature is that it looks at facts and what has happened in the market or in the various markets and determines whether or not the airlines have scheduled sufficient service to meet their certificate requirements.

- Q. - Why then doesn't the Board consider taking the same approach to charter operations? It's the management's discretion as to how much scheduled operations the carrier wants to operate, the kind of plane he wants to use and so forth. Some of them might make the argument that a charter operator of any kind should be able to make the same decision and offer his services

in any way he likes according to any criteria and preference he has. That's the market working. The Board is not letting that happen, it never has, at least, as far as charter specialists are concerned.

- A. - I think that somebody used the phrase that it is very subjective. I think someone used it this morning or this afternoon, and that it would be a very subjective conclusion to reach. What are your criteria for determining what elements go into scheduled service requirements vs. charter service requirements? I think that it is just a genuine difference of opinion and since the Board would be the agency that would have to decide this thing, it should determine what issues are involved. There is not an inclination to try to crystal ball it and determine what the future relationship between charter services and scheduled services ought to be. We haven't had a sufficient test period. We don't have sufficient basic information to know what proportion of the traveling public on the North Atlantic requires scheduled transportation, and what is available for charter services. We can't predict that today. It's preferable to let the scheduled operators operate chartered service and also let the supplementals operate

the charter services and let the scheduled services diminish. I disagree with the notion that scheduled services have to remain at least at the level they are today and may even have to increase if they can do so. I don't accept that. This is because there are different ways to provide for the product that the consumer is looking for in air transportation. We don't have to do it the way we did it 25 years ago.

Q. - Let me return to your comments on the European experience. You made a comment that the charter markets that developed in Europe are not in competition with the scheduled carriers. Was there anything to prevent the scheduled carriers from developing them?

A. - Well, it is actually more complicated than that. You have the scheduled carriers competing with the charter specialists on charter service as well as their own scheduled service. But let me ask a question. If the Board does not engage in some kind of a more relaxed policy on charter, how are we ever going to find out what the charter potential is? What European experience tells me is that the only way you can develop charter service is not to compete with scheduled flights and you say that on the North Atlantic you can't do that.

However, on the North Atlantic you've actually got charter competition provided by both scheduled carriers and by charter specialists.

- A. - Let me say that these competitive factors are not lost. They raise serious questions for all of to consider. As I said earlier, the key point to consider is what kind of service is the public demanding?

N73-32900

COMMERCIAL AIRCRAFT DEVELOPMENT & THE EXPORT MARKET

by Joseph Snodgrass
Aerospace Industries
Association

July 20, 1972

Abstract

In the past several years, industry has been faced with a number of elements which endanger the future of commercial aircraft development: a decline in federally funded R&D programs; a general decline in the economic health of the domestic airlines; the increased cost of development which may be several times the net worth of the company; the development overseas of common market and manufacturing consortia; and foreign manufacturers receiving significant financial support from their national governments. These last items have acted to significantly increase the pressure in the export market placed on the U.S. manufacturers. Unless immediate and innovative solutions are found to combat these elements, the future of the industry is in jeopardy.

COMMERCIAL AIRCRAFT DEVELOPMENT AND THE EXPORT MARKET

(Ladies and) gentlemen, I represent the Aerospace Industries Association, the voluntary trade association representing many of the U.S. manufacturers of aerospace vehicles and equipment. My paper today is largely based on a recent study conducted by our Aerospace Research Center. I present this paper more in the hope of provoking discussion than in providing information.

In 1971, for the first time in this century, the United States registered a negative balance in its trade with foreign nations, shocking the complacency of those who had long regarded American competitive superiority as an immutable fact of life.

The U.S. trade deficit is symptomatic of the sweeping changes taking place in international competition. The trade fortunes of many nations -- notably the members of the European Economic Community and Japan -- are in the ascendancy while those of the United States are in disquieting decline. There are many contributing factors to this turn of events¹ but principal among them is the determination of other industrialized nations to upgrade their own economies by capturing greater shares of the international market.

1 "Our international competitive position has been weakening for a variety of reasons: changes in international trading practices and patterns; developing inequities in both agricultural trade and the proliferation and preferential arrangements for industrial products; basic changes in the U.S. economy; and a monetary system whose lack of flexibility resulted in intolerable burdens being thrust upon the United States as we continued to meet our international economic and security obligations. These problems were brought to a head as a

result of inadequate increases in productivity, excessive domestic inflation over the last half of the sixties, a breakdown in the class international monetary and domestic adjustment mechanism and, of course, massive short-term capital flows." Peter G. Peterson, Secretary of Commerce, then Assistant to the President for International Economic Affairs, "A Foreign Economic Perspective," December 27, 1971, page ii.

As they have already demonstrated, they have the ability to do so. Their determination is backed by a willingness to provide government support in areas of export promise.

In this atmosphere of intensified international competition, a key engagement in coming years will be the economic battle for supremacy in sales of commercial air transports. This is an area of vital importance to the balance of trade because of the enormity of the anticipated market.

The U.S. was able to take an early lead in supplying transport aircraft due to its strong economic position among the countries of the world coupled with the bank of available research and development data that it possessed at the end of World War II.² During and before the war, the nation had conducted an aeronautical R&D program of extraordinary magnitude. From the technological base thus provided, American companies were able to develop commercial products rapidly and with minimal financial strain.

In the postwar decade, U.S. plane builders further benefited from new technology made available by advancing military R&D. It was a period of leapfrogging technology which induced rapid obsolescence, requiring the military services to initiate frequent development "starts" over a wide range of aircraft types. Civil transport builders benefited either directly (from military cargo plane development) or indirectly (from airframe, engine and other technology).

2 Civil Aviation Research and Development Policy Study, a joint study by the Department of Transportation and the National Aeronautics and Space Administration, Supporting Papers Volume, March 1971, p. 28.

Of additional advantage to U.S. industry has been the size of the American domestic market for transport aircraft. By 1950, domestic air traffic, as measured in passenger miles flown, had mushroomed to eight times the 1940 level. Except for flattening-out periods in the late 1950's and in the last few years, the growth curve climbed dramatically over the past two decades.³ This growth fostered airline demand for more airplanes and more types of airplanes. "American manufacturers enjoyed an assured U.S. domestic market of sufficient size to break even on development, manufacturing and testing costs on almost all new aircraft introduced. Export sales were the major source of profits. In contrast, European builders were restrained by the realization that they could expect to break even on a new aircraft only if substantial export sales could be achieved. In the face of tariff and other trade barriers, and severe American competition, they were seldom inclined to take the risk."⁴

The domestic market provided other competitive edges. Strong airline demand allowed long production runs, which reduced manufacturing costs, hence unit price. The many different services provided by U.S. airlines inspired development of a broad range of aircraft offerings, each type tailored to a particular service need. Thus, U.S. manufacturers were able to blanket the spectrum of civil transport requirements. (Chart 1).

The U.S. commercial aircraft industry is now able to produce whole families of aircraft models simultaneously. It presently possesses the

3 Aerospace Facts and Figures, 1971/72, p.110.

4 CARD Policy Study, March 1971, Supporting Papers Volume, p.5-32.

physical resources to turn out eight different models at an aggregate rate of 77 airplanes per month. However, in contrast to this capability production during 1971 averaged 16 per month.

A final advantage accrued from the intense competition among American manufacturers for both the domestic and foreign markets. This promoted advancement of aggressive marketing techniques, including brilliant support by the Export-Import Bank and post-sale support features more attractive than those offered by foreign competitors.

Continuing technological excellence, coupled with the other advantages cited, enabled the U.S. to maintain marked dominance of the world air transport market over the quarter-century-plus since World War II. In 1954, the peak year of U.S. supremacy, 86.6 of the civil transport aircraft operating with free world airlines were of American manufacture. In other years, the proportion ranged from more than 70 percent to well over 80 percent. Today, it is about 76 percent.⁵

The advent of automated weaponry in the 1950's brought a reduction in the number and types of military aircraft needed, hence a marked decline in Department of Defense prototype starts. Although transport manufacturers continued to profit indirectly from the military deposits in the U.S. technological bank, the degree of direct fall-out declined sharply.

5 International Air Transport Association, "World Air Transport Statistics," (Annually)

Today, however, we are faced with the distinct possibility of losing our long-held market superiority and the attendant economic benefits. In the short term there are two factors exerting a negative influence. These are the poor economic health of the operators which reduces the domestic demand for transport aircraft and the current national malaise of anti-technology which has dulled our traditional national appetite for research and development. In the long term there are factors less likely to go away at work.

A changing tide of events over the past decade or more has eroded most of the traditional American advantages and at the same time provided foreign manufacturers with certain competitive advantages over their U.S. counterparts.

This swing of the pendulum has resulted primarily from the establishment, among foreign governments, of national objectives related to capturing greater shares of the world civil aviation market. The governments of Western Europe and Japan have provided strong financial support toward the attainment of these objectives, particularly in the key area of research and development aimed at improvement of national technical competence. An indicator of the intensity with which they have pursued these aims is a comparison of U.S./foreign aerospace R&D growth in recent years. The growth rate for the European Economic Community has averaged about 15 percent annually, compared with 6 percent of the U.S. The disparity is even greater in consideration

of the fact that the European nations have focused sharply on trade-oriented R&D while the U.S. figure includes substantial though declining commitments to defense and space as well as civil aviation R&D.

A major influence on improvement of the foreign competitive posture has been the growing adoption, in Europe, of the consortium approach to aircraft development. The advantages of multinational cooperation are outlined in a statement by France's Union Syndicale des Industries Aeronautiques et Spatiales:

"Cooperation makes it possible to undertake programs that would be beyond the means of a single country. Financing is broken down to dimensions that can be digested by each partner. As these programs are subject to inter-governmental agreements, the danger of breaking off contracts is eliminated. In this way, existing facilities for research, development, testing and production, the real capital of the partners, can be orchestrated and used to the greatest possible efficiency. A further significant advantage is that production batches are larger, as programs are designed to meet the requirements of all the countries involved, and this means that unit prices are finally lower."⁶

6 L'Industrie Aeronautique et Spatiale Francaise, Union Syndicale des Industries Aeronautiques et Spatial, Paris, 1971.

Intensified R&D, cooperative venturing and other measures have combined to reduce American competition. For example, consolidation of the EEC internal market by means of consortium development and built-in sales to participating members has negated the long-standing U.S. advantage of broader home market. "The European countries, working together, now constitute a market that approaches the American market in size. It can therefore provide the large production runs which American industry has claimed as its own unique advantage."⁷

As it did in the U.S., the broader market tends to influence development of a wider range of aircraft types, because of differing kinds of service provided by the airlines of cooperating nations. It is Europe in combine, rather than the U.S., which now boasts the more extensive range of commercial aircraft offerings.

Foreign competitors have also successfully modernized their marketing techniques. They now have sufficient strength to offer the same "total" package as U.S. manufacturers, which includes training, spares, repairs and other after-sale support. They have, in fact, acquired a degree of marketing superiority by virtue of government aid. "In addition to direct loans and subsidies to their manufacturers, foreign governments have shown willingness to support their industry marketing efforts by means of attractive

7 Aerospace Daily, May 25, 1971.

financing arrangements, including longer payback periods than those legally permitted by the U.S. Export-Import Bank. They have also adopted practices eliminating requirements for supplier financial participation and for guarantees from the government of the purchaser; in some cases, they are also providing substantially lower interest rates."⁸

With regard to technological capability, years of intensive R&D effort has substantially upgraded the posture of the foreign competition. The U.S. still enjoys a margin of superiority in general technological competence, but the gap has narrowed considerably. In certain specific areas, there is no gap at all; in others, foreign nations hold the lead. "Some foreign-built aircraft and items of equipment have already attained a quality equal or superior to products from the United States..."⁹

If this is not enough, there is the enormous problem, little known outside aviation circles, called the "money barrier." It is the inability of American plane builders to finance the development of new types of aircraft essential to effective competition. Development costs have risen to the point where it takes upward of a billion dollars to translate an advanced technology design into an operational airplane. No individual manufacturer can afford resources of that order. Private investment capital is no longer available to the extent required; a number of contributing factors have inclined the financial community to the view that the potential return does not justify the risk. (Chart 2).

8 CARD Policy Study, Supporting Papers Volume, p.5-30.

9 CARD Policy Study, Supporting Papers Volume, p.5-29

This chart presents a horror story in condensed fashion. This is the financial history of a development programs for a hypothetical new technology subsonic jet transport. From the first day until the program generates income (well after the first deliveries) a negative cash position of some \$1.4 billion has developed. Is there a prudent manager in any industry that will expose his company to a financial risk equal to many times its net worth for a programs which only breaks even at the end of its ninth year?

As a result, no advanced commercial transports are being developed in the United States at this time. Unless the financing dilemma is resolved, American competition in the world market will be limited to sales of the existing family of wide-body jetliners and improved variations of them, demand for which is expected to continue for about another decade. These airplanes embrace only a narrow portion of the future air transport spectrum. There are no American counterparts for several new types being developed by foreign manufacturers, who enjoy the strong financial backing of their governments. At best, the U.S. can expect a lesser share of the total market than its traditional 70 percent - 80 percent; at worst, the U.S. share could dwindle to nothingness by the mid-1980's.

This situation arises at a time when (1) the competitive challenge from abroad has reached its greatest level of intensity and (2) the U.S. is already experiencing a marked deterioration of its overall international trade posture.

The Market

An early **solution** to the financing problem becomes doubly important in

consideration of the vast size of the projected market for civil transports. Forecasters anticipate, by 1985, a fourfold growth in airline passenger traffic and an even greater expansion of air cargo movement. This growth will induce heavy demand for new commercial transports, including types already in service or in development and, in later years, advanced-technology airplanes not yet in development. It is estimated that sales in the 1974-1985 time span will amount to an enormous \$148 billion, a sum approximating the value of all aircraft -- civil and military -- produced in the U.S. during the past 20 years (Chart 3). Continued American pre-eminence in the market can bring economic benefits of exceptional order, not only in international trade balances but also in such areas as gross national product, employment and tax receipts. Conversely, American inability to compete would have shattering deleterious impact in all those areas.

The Economic Impact

At stake in the world air transport competition during the 1974-1985 period is the very substantial sum of nearly \$78 billion. This represents the difference in sales between (a) the estimated U.S. share of the market of American plane builders are able to compete in all categories of transport demand and (b) the estimated share if U.S. competition is restricted to the already-developed wide-body jetliners.

If the U.S. does compete in all categories, it can expect to capture 90 percent of the long-range market, 80 percent in the medium-range category and 70 percent in the short-haul class. This would amount to a total sales volume for the 12-year period of \$118 billion, or an annual average sales level of more than \$9.8 billion. The average represents more than double

the current level of commercial transport sales and clearly implies national economic benefits of large order. Of particular importance would be a balance of trade contribution of \$5 billion annually.

If the U.S. does not compete with new types of aircraft, it is estimated that foreign nations will capture more than 70 percent of the total market. The U.S., by virtue of continuing sales of wide-body jetliners and evolutionary improvements of them, can expect a total volume of over \$40 billion. The potential loss of business translates into 1.5 million man years of lost U.S. employment or a payroll loss of \$30 billion. Additionally, there would be a loss of nearly \$11 billion in federal income taxes alone. The impact on the balance of trade would be drastic. By 1976, the current positive balance in airplane trade would become negative and by 1985 the deficit would grow to \$4.5 billion annually. The cumulative negative balance of trade in aircraft would exceed \$18 billion (Chart 4).

Alternative Solutions

For years to come, there may be no way of financing major aircraft developments entirely by private U.S. capital. Yet the problem demands immediate solution because of the long lead time associated with aircraft development (Six years or more).

The answer may lie in U.S. government assistance to offset the support provided to foreign competitors by their governments. Government/industry cooperation is consistent with the policy recently affirmed by President Nixon: that government aid to private sector research and development is "necessary and desirable" in cases where the national interest is involved and the required investment is beyond the capability of private industry.

The Administration is considering a number of proposals for government/industry cooperation in civil transport development. Some of the proposals are directed toward solidifying the domestic market by improving the financial health of the transport manufacturers' customer, the U.S. airline industry. Others deal more directly with the development financing problem, for example, tax incentives; methods of increasing fall-out from military development; antitrust exemptions to permit American manufacturing consortiums; government-guaranteed loans; and government sharing of profits and risks with the manufacturer. Each has its advantages and disadvantages; none has emerged as a completely viable solution.

Study and review of the various options has made it evident that finding a solution acceptable to the Administration, the Congress, the public and the industry will be extremely difficult. The prospect of government assistance or participation in aircraft development raises at once, for industry, the spectres of government control of management and technical decisions; serious erosion of the traditional competitive environment; tarnished public image, and one more step towards the possibility of government ownership. Further, any plan to improve the state of the manufacturing industry must presuppose good economic health of the air lines. Yet, barring some unforeseen rapid improvement in the industry's financial posture and a change in the private investment climate, some formula for government/industry cooperation must be found. The alternative is cession of American pre-eminence in commercial airplane manufacture, with all the consequences such forfeit implies -- loss of trade posture, productivity, taxes and jobs, and not inconceivably, loss of a vitally important segment of American industry.

In summary, we seem to arrive at the following conclusions:

Research and Development

The apparent national loss of confidence in and understanding of the role of technology in our society must be overcome. We, as a nation, must appreciate the direct inter-relationship between technological advance and national progress. With this recognition we must begin to restore the foundation of our neglected technology with new vigorous research and development programs in aeronautics.

U.S. Competitive Handicaps

In a new era of stronger competition from abroad for world civil air transport sales, U.S. manufacturers are at a distinct disadvantage. A major problem is the inability of U.S. plane builders to finance the advanced aircraft developments that are essential to their ability to compete. Foreign competitors enjoy varying degrees of government support in financing new developments. The traditional funding sources of U.S. industry -- corporate finances and private investment capital -- have dried up. Unless a new approach to development financing is forthcoming, the U.S. industry's ability to compete will be sharply limited and the international civil transport market, long dominated by the U.S. will go by default to foreign competitors.

Government/Industry Cooperation

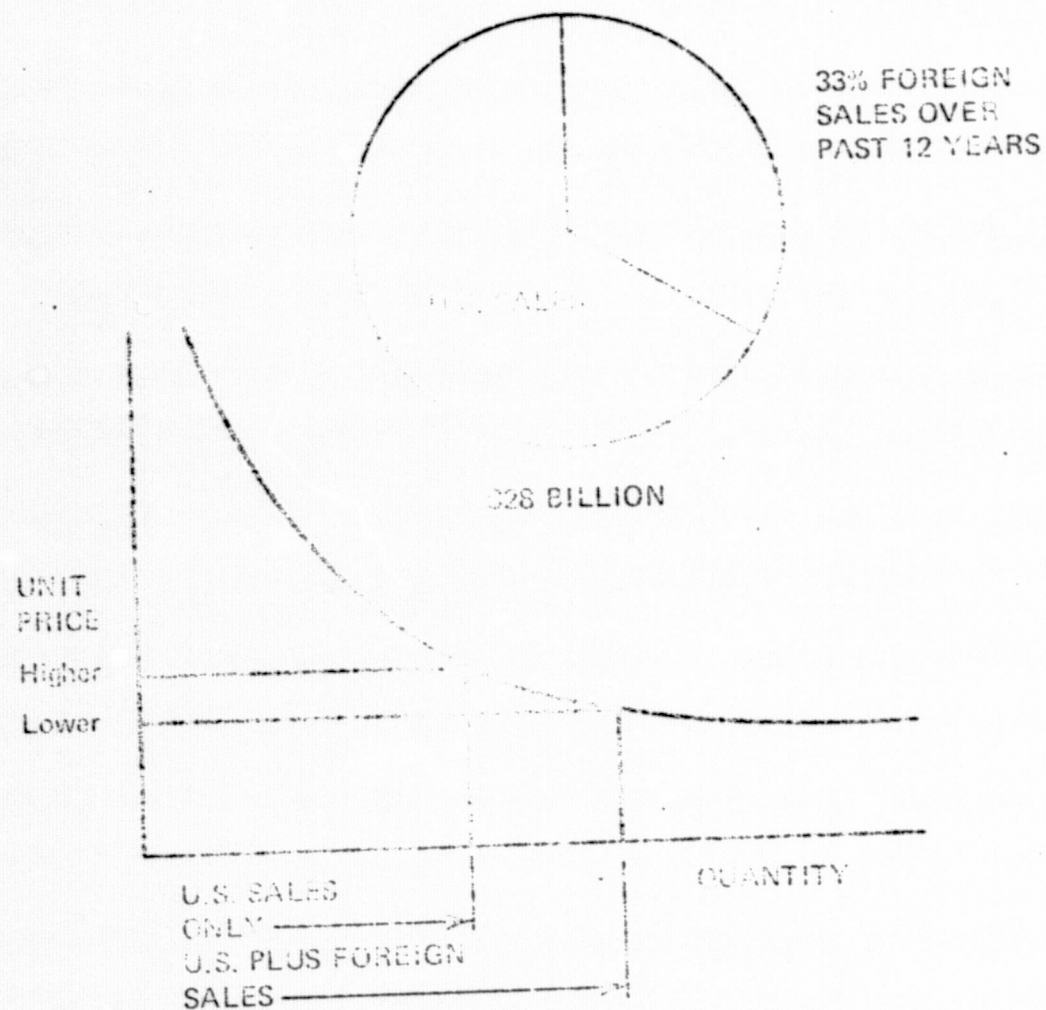
The broad economic impact of commercial airplane sales justifies support of U.S. manufacturers to offset the support foreign competitors are getting from their governments. Government/industry cooperation in research and development is consistent with current Administration policy. The Administration is considering a number of proposed initiatives for such cooperation,

but no viable solution has emerged. It will be difficult to find a solution acceptable to all parties, yet it must be found.

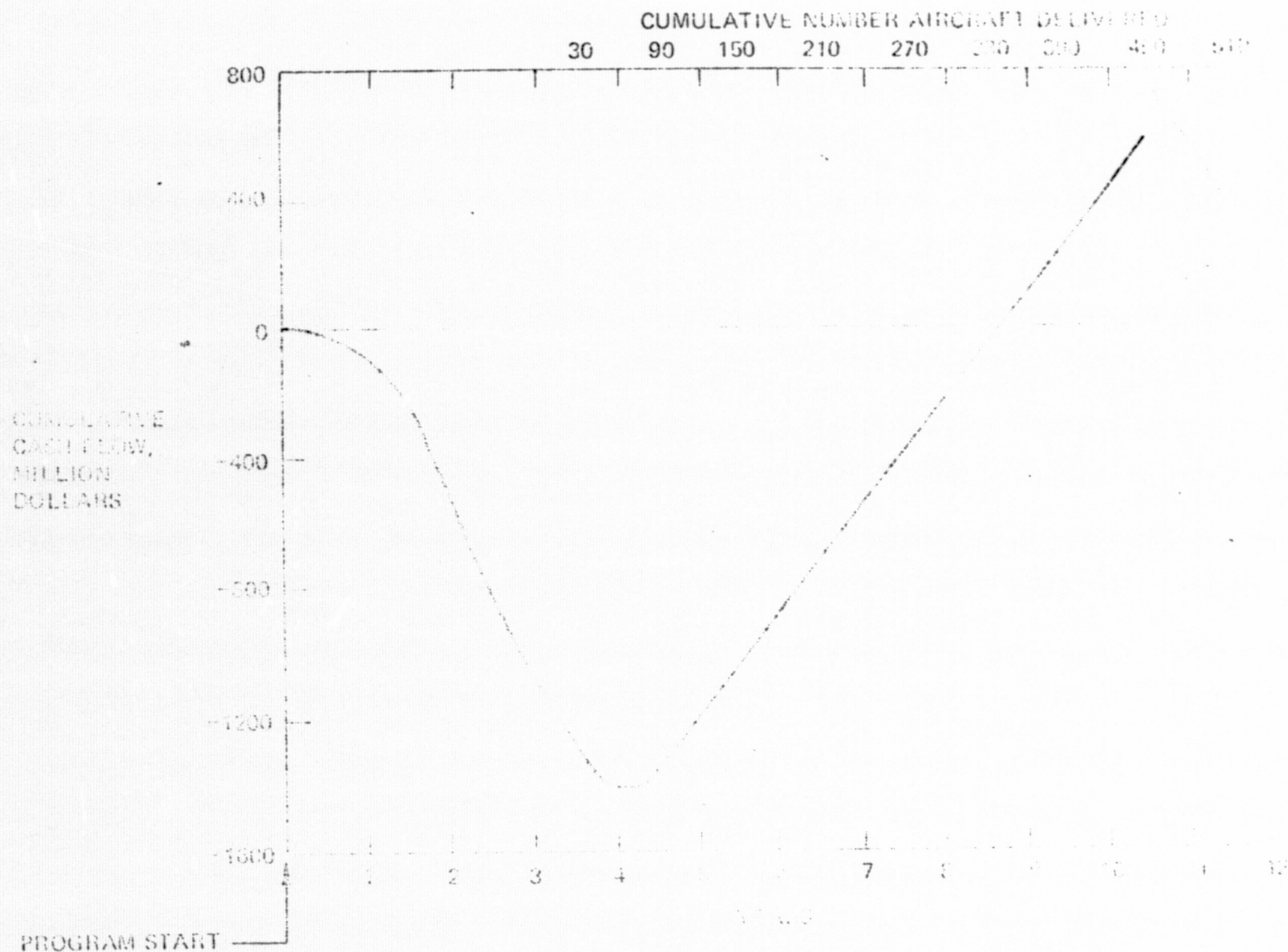
A Matter of Urgency

The financing problem cannot be put aside until a more propitious time. It takes several years of development effort to translate a design into an operational airplane. Foreign competitors are already flying several types of aircraft for which no U.S. counterpart exists and with each day the chances of retaining U.S. market dominance diminish. If the nation is to realize the economic benefits available from the coming round of aircraft sales, a way of breaking the money barrier must be found immediately.

Contribution Of Foreign Sales To Broadened Production Base



Cash Requirements Large Commercial Aircraft Programs Private Financing

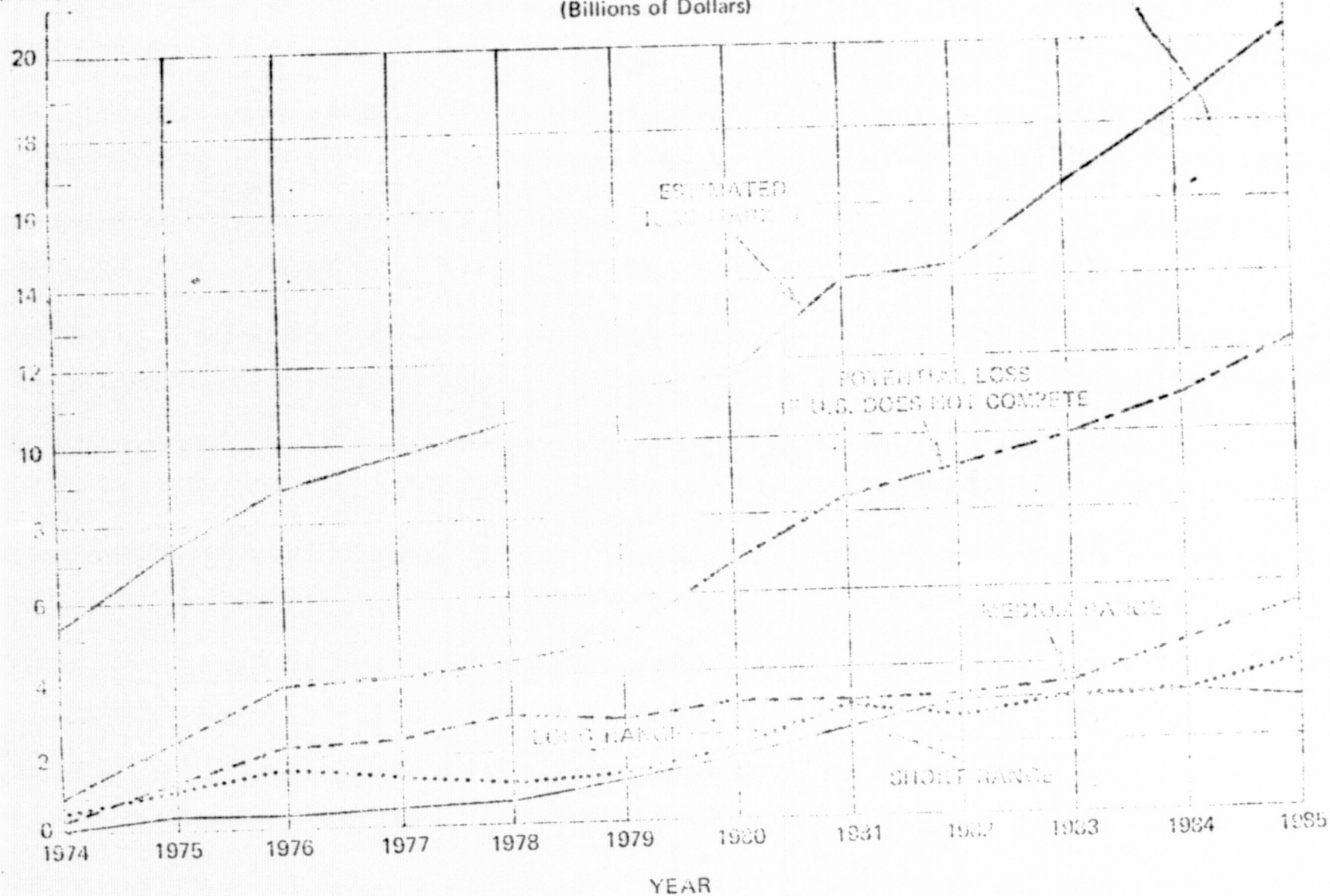


REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR.

Commercial Transport. Aircraft Sales

1974-1985
(Billions of Dollars)

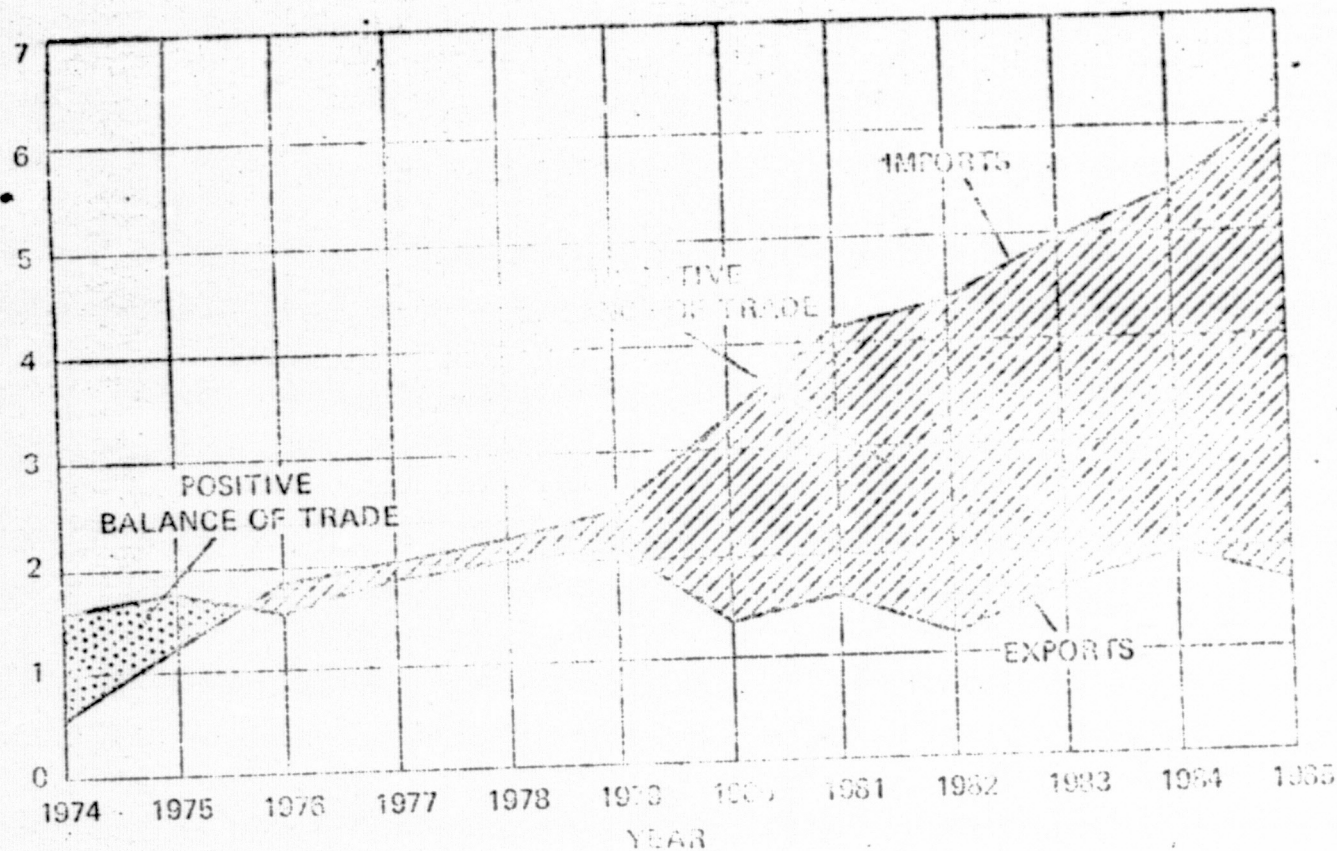
\$ BILLIONS



REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR.

Impact On Commercial Transport Aircraft Balance Of Trade

\$ BILLIONS



REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR.

1473-32901
July 18, 1972

SCHEDULING FOR PUBLIC SERVICE
IN INTERNATIONAL OPERATIONS

Melvin A. Brenner

In all of the debate that has revolved around the charter issue, one principle has been accepted by all -- namely, that Governmental charter policy must not jeopardize the maintenance of an economically viable network of scheuled air service.

While there has been disagreement as to the extent to which specific proposed charter rules do threaten a viable scheduled network, nobody -- not even the most ardent supporter of supplementals -- has challenged the overriding proposition that a healthy scheduled network is essential.

Recently, however, the discussion has taken a new turn. Some, including the DOT, have posed the question: "Granting that a scheduled network is essential, is it possible that the essential size of that network is less than the size now operated? Is it possible, in other words, that a significant contraction from today's scheduled system would be acceptable in the public interest?"

I submit that the only valid answer to these questions is: No. Contraction could occur only on terms that would be unacceptable to the national interest.

To document this position, we must get down to cases, and examine some fundamental aspects of scheduling in international air service. I will draw my examples from TWA's experience for the sake of convenience. I can assure you that the picture would be essentially the same if I used the experience of other carriers.

First, we must recognize that international air markets do not have dense traffic volumes to begin with, and this leads to a thin level of schedule frequency on even the largest routes. There seems to be great misunderstanding on this point, derived no doubt from the types of schedule frequency levels to which we are accustomed on domestic routes. Domestically, it is quite common for routes of consequence to have as many as ten or more daily flights per carrier.

There is no similarity whatever between such domestic patterns, and the situation on international routes. Consider, for example, the basic year-round pattern that TWA operates across the Atlantic -- that is, the pattern we operate in all but our peak summer season.

Chart 1 shows the total frequency we operated to Europe this past winter and spring. All told, it comprised 14 departures per day.

Let's place that in some perspective. Chart 2 compares our entire transatlantic frequency with the daily frequency operated by Allegheny Airlines on just a single domestic route of moderate size, New York - Pittsburgh. This past winter, Allegheny operated 11 daily frequencies on just that one route.

Bear in mind that our transatlantic pattern served four separate U.S. gateways, and provided all of our service to such major destinations as England, France, Spain, Portugal, Italy, Switzerland, Germany, Greece, Ireland, Israel, and Egypt.

And to cover these vastly important areas, over the world's largest overseas route, we operated a grand total of three more daily departures than Allegheny operated on the single route New York - Pittsburgh.

This contrast should help at the outset to test the credibility of any suggestion that the essential level across the Atlantic might be something less than today's. I must assume that such suggestions start from misunderstanding about the base level of international schedule frequencies -- misunderstanding that probably stems from domestic norms.

But let's move on to another significant point.

Other than in peak season, there is only one transatlantic route -- New York - London -- where TWA has been flying more than one non-stop flight per day. When you're down to one flight per day, there really isn't much room for further contraction.

And this is particularly true when considering the nature and level of foreign flag service, and the impact this has on the level we must maintain if we are to remain competitive.

Chart 3 shows TWA's versus foreign flag schedules, in all markets we are authorized to serve and where non-stop service is operated either by TWA or by our foreign competitor.

Note these facts:

1. There were only four markets where TWA provided more capacity than the foreign national carrier.
2. There were five markets where the foreign carrier matched TWA.
3. But there were eighteen markets where the foreign carrier provided more service than TWA.

This scarcely suggests a situation where there is room to contemplate actual contraction from current TWA levels, while still preserving a viable, strong competitive posture for U.S. flag service.

The question may be asked: Why doesn't TWA fly more than the pattern I have shown? Why don't we match our foreign flag competitors on every route they serve?

The reason is simple, and has great relevance for the whole issue of charters vis-a-vis the maintenance of a scheduled network. In the highly seasonal transatlantic market, traffic density is quite thin for most of the year, in most of the markets.

Thus, in the six months through March of this year, our average transatlantic load factor was only 44%. And that, bear in mind was prior to any further erosion of scheduled traffic to charters; it included the benefit of carrying many personal and pleasure travelers at promotional discount fares; it related

to a basically conservative pattern of frequency -- one trip per day on even the primary traffic markets. Most of our foreign competitors are government-owned and/or government-supported, and this helps to account for the differences shown above.

Incidentally, our Government has expressed concern about the thin nature of U.S. flag schedule patterns across the Atlantic.

For example, let us note some little-quoted passages of the President's Statement on International Air Transportation Policy. For example, that Statement said:

"Every effort should be made to improve U.S. carrier competitive performance vis-a-vis foreign flag carriers in some markets, particularly the North Atlantic. Continuing to improve the quantity and variety of services in such markets would enhance our competitive standing." [Emphasis added]

Note particularly the call for improving the "quantity" of U.S. flag service.

This Policy Statement could scarcely be reconciled with a present suggestion that the essential level of U.S. flag service might be something less than that now operated.

Note also the following in the President's Policy Statement.

"This policy should take into account the public's need for additional or improved air services, including new direct services from U.S. points other than major gateways..."

Here again, that statement could not be reconciled with a suggestion that we contract from even the present scope of scheduled service. When the President's policy refers to the public's need for new direct services from other U.S. gateways, can it seriously be suggested that the public does not need at least the once-per-day frequency we now operate in major markets?

Incidentally, shortly before the President's Policy Statement was issued, the Department of Transportation filed petitions with the CAB and those petitions got more specific in expressing much the same points. Thus:

- . The DOT expressed concern that Swissair provided direct service between Chicago and Zurich, while no direct U.S. flag service was available on a through-plane basis.
- . It expressed concern about the fact that U.S. flag carriers were authorized to provide direct scheduled service to Europe from only 12 points in the U.S. "As a consequence," DOT said, "a vast area of the United States...is almost entirely lacking in the faster, more convenient, service that direct routes to Europe would provide."
- . The DOT expressed concern that traffic between the United States and some European markets "is carried largely -- in some cases almost entirely -- by European flag carriers, even though United States citizens make up most of the traffic."

So here we have a series of policy statements -- by the President, and by the DOT -- all forming one general pattern. They expressed concern about the number of markets where foreign flag carriers already scheduled more service than U.S. flag carriers. They suggested a public need for more direct scheduled U.S. flag service from more points in this country.

In terms both explicit and implicit, these expressions of concern called for more -- not less -- U.S. flag scheduled service.

When we relate these statements to the facts I have cited earlier as to the limited frequency we presently operate in almost all transatlantic markets, it is difficult indeed to visualize the public interest being adequately served with a lesser level of U.S. flag service.

Perhaps it will be suggested that a reduction to even less than one frequency per day might be viable because such cutback by U.S. carriers might be matched by foreign flag operators. Even if we overlooked the deterioration of service convenience if all carriers on a route dropped to service once every few days, reliance on such a competitive development would be a fragile and implausible reed on which to rest the future of U.S. flag service.

The track record of foreign flag carriers simply does not support the assumption that, on the type of major routes here discussed, they would make less-than-daily service competitively viable by dropping to that same level themselves.

For example:

- . In the off-season, TWA drops from non-stop to one-stop service on New York - Zurich. But Swissair maintains non-stop service.
- . In the off-season, TWA has been dropping from daily to once-per-week service on New York - Shannon. But Aerlinte maintains daily service.
- . In the off-season, TWA drops from two non-stops to one non-stop New York - Paris. But Air France maintains two daily non-stops, thereby providing the only daytime service eastbound.

As noted, most of our foreign flag competitors are government-owned and/or government supported. To each one, its route to the United States represents its primary international market. To each one, this represents the primary opportunity to gain productive utilization on its most expensive aircraft, such as 747s now, or for some, Concorde in the future. And beyond this, almost all European countries regard it as being in their national interest that frequent scheduled service on the Atlantic be provided by a national flag carrier.

To assume that foreign flag carriers will cut back to less-than-daily service in major markets, just because U.S. flag carriers might have to do so, is to make an assumption at odds with past history or present experience.

Against the perspective of the preceding discussion, let us now turn to one of the specific recent proposals for defining the essential level of U.S. flag service at substantially below current levels.

In recent testimony before the Senate Commerce Committee, Paul Cherington testified on behalf of the supplemental carriers. He recommended that the level of essentiality for scheduled services be determined by excluding those passengers now traveling on scheduled airlines at various promotional fares, and then computing the number of seats that would be required to handle the remaining traffic, at a load factor of over 60%.

Mr. Cherington did not discuss any specific results of his proposal, so let me supply a few.

On New York - Paris -- our second largest transatlantic route -- Mr. Cherington's proposal would define TWA's "essential" level as being the equivalent of about one 707 flight every two days, or one 747 flight every four days.

As we have already seen in Chart 3 above, this is a route where, even in the winter, our foreign flag competitor operates two non-stops every day -- a 747 and a 707.

Is it realistic to say that in this market the level of essentiality for TWA is either a 707 every other day, or a 747 every four days? Could TWA possibly remain competitive on such a basis with a foreign flag carrier that could reduce from its current level and still have a daily 747 remaining? Could such a competitive relationship possibly be squared with the Presidential and DOT policy statements quoted above?

I previously noted the DOT concern about the absence of U.S. flag through-plane service to match Swissair's one-stop service between Chicago and Zurich. DOT was so concerned that it suggested the possible need for certificating a new U.S. scheduled carrier into Chicago - Zurich to remedy such deficiency in that market of distinctly secondary size. That's an interesting backdrop against which to view the present Cherington proposal, which would define the level of essentiality at about one 747 every four days for TWA in a market of such major importance as New York - Paris, which is roughly 30 times the size of Chicago - Zurich.

The proposal stems from two premises, both of which are faulty. The first is that economically viable scheduled service in competition with the foreign carriers could be supported on full fare traffic alone. The plain fact is it could not.

The second faulty premise is that anybody traveling on scheduled services at discounted promotional fares does not need, desire, or benefit from scheduled service, and hence should not be included in the base level of traffic for determining an "essential" level.

This is like saying that anybody who buys a refrigerator in a discount house didn't really need that refrigerator, or else he would have avoided the discount.

This concept of disenfranchising the low fare passenger from scheduled service ignores the fact that our scheduled system has developed over decades -- long

before supplementals were significantly in the picture -- with a very strong promotional drive to encourage personal and pleasure travel. This was done in recognition that business travel alone did not contain the potential growth to support the advancing technology of air transport.

Even the first family of jets -- which now seem almost small by present standards, but which seemed very large indeed by the standards of 1959 -- could not have been supported if the marketing base of this industry had been confined just to passengers traveling for business reasons.

The scheduled carriers recognized long ago that the best service for the total public -- business and non-business traveler alike -- depended upon promoting growth in both sectors, and serving both jointly with a type of equipment and a type of service that neither could support in isolation.

So, for decades past, one of the prime goals of the transatlantic scheduled industry has been to aggressively promote the growth of pleasure travel through all forms of marketing, including particularly promotional pricing.

By 1966 -- a time when the supplementals were still just a minor factor -- the scheduled industry had already developed the personal and pleasure market to the point where it accounted for three-fourths of total transatlantic travel.

The Cherington proposal would now ignore the fact that low cost travel has for years been built right into the whole structure of the scheduled air transport system. Ignoring this fact, it would attempt to define the future essential level of scheduled service on the basis of just one part of the market now using scheduled service. And thus it leads to such unreal results as a New York - Paris pattern for TWA of one 747 flight every four days.

It is very difficult to see how such a proposal could possibly benefit the general public, or that part of the public that is interested in low fare service.

Before closing, I should like to anticipate two questions that might be raised by this discussion.

First, since my data on frequencies related to the non-peak season, a question may arise as to whether our summer peak season frequencies alter the picture markedly.

In the summer, we do operate seasonal increments to our capacity. But they do not alter the picture fundamentally. A major part of our summer overlay brings direct service -- or a rounding out to daily direct service -- to secondary markets where winter traffic levels have not thus far been able to support such service. Thus, we have in the summer added direct service in markets like Detroit - London, San Francisco - London, Washington - Paris, and Philadelphia - London.

Significantly, even in the summer, there are only three routes on our transatlantic system where we operate more than one daily frequency. (Chart 4)

The second question I'd like to anticipate relates to the 747. Is it possible that we could reduce capacity, without dropping out of markets, by just replacing 747s with 707s?

On paper, yes; in the real world marketplace, NO. Certainly there are many days and many flights on which we could wish the B-747 were a smaller plane. But that wish cannot alter the fact that the wide bodied comfort features of the 747 have become the new competitive standard for all major transatlantic routes.

TWA has not been overly aggressive in assigning 747s to our Atlantic routes. Indeed, as shown on Chart 5, there is presently only one route where we operate a 747 and where our foreign flag competitor does not. But there are actually many routes where we have not upgraded to a 747 and where our foreign competitor has.

So here again, we cannot find in this area a means of safely reducing our capacity, while remaining adequately competitive.

So I come back to the point I made earlier. Of course there is a minimum essential level of U.S. flag service in international operations. But it most assuredly is not just a small fraction of what we are now operating. It is at least as large as the base we now have, if not larger.

Recognition of this basic fact is essential to the formulation of a sound policy of charter regulation as this impacts upon the maintenance of a healthy, viable, competitive network of scheduled U.S. flag air service.

CHART 1

TWA TRANSATLANTIC PATTERN AVERAGE DAY, WINTER 1971/72

<u>Route</u>	<u>Nonstop Daily Frequency</u>
New York-London	3
New York-Frankfurt	1
New York-Paris	1
New York-Geneva	1
New York-Milan	1
New York-Lisbon	1
New York-Madrid	1
New York-Rome	1
Boston-London	1
Boston-Paris	1
Chicago-London	1
Los Angeles-London	1
Total	14

Note: Excludes three segments which had only one flight per week.

CHART 2

TWA TRANSATLANTIC PATTERN COMPARED WITH ALLEGHENY

NEW YORK - PITTSBURGH PATTERN

AVERAGE DAY, WINTER 1971/72

<u>TWA Transatlantic Nonstop Pattern</u>	
Flight 702	New York-London
Flight 700	New York-London
Flight 708	New York-London
Flight 740	New York-Frankfurt
Flight 800	New York-Paris
Flight 832	New York-Geneva
Flight 842	New York-Milan
Flight 900	New York-Lisbon
Flight 904	New York-Madrid
Flight 840	New York-Rome
Flight 754	Boston-London
Flight 810	Boston-Paris
Flight 770	Chicago-London
Flight 760	Los Angeles-London

Total: 14 Daily Departures

<u>Allegheny New York-Pittsburgh Nonstop Pattern</u>	
Flight 905	Newark-Pittsburgh
Flight 841	LaGuardia-Pittsburgh
Flight 909	Newark-Pittsburgh
Flight 863	LaGuardia-Pittsburgh
Flight 857	LaGuardia-Pittsburgh
Flight 859	LaGuardia-Pittsburgh
Flight 847	LaGuardia-Pittsburgh
Flight 849	LaGuardia-Pittsburgh
Flight 771	Newark-Pittsburgh
Flight 901	Newark-Pittsburgh
Flight 839	LaGuardia-Pittsburgh

Total: 11 Daily Departures

CHART 3

TWA TRANSATLANTIC PATTERN COMPARED WITH
FOREIGN FLAG NATIONAL CARRIER

WINTER 1971/72

Route	<u>Daily Nonstop Frequencies</u>		<u>Carrier With Leading Capacity</u>
	<u>TWA</u>	<u>Foreign Flag</u>	
New York-Shannon	*	1	Foreign
New York-London	3	3	Foreign (more 747)
New York-Frankfurt	1	2	Foreign
New York-Paris	1	2	Foreign
New York-Geneva	1	1	Foreign (747)
New York-Zurich	-	1	Foreign
New York-Milan	1	1	Foreign (747)
New York-Lisbon	1	1	TWA
New York-Madrid	1	1	Equal
New York-Rome	1	1	Equal
New York-Athens	*	*	Equal
New York-Tel Aviv	-	1	Foreign
Boston-Azores	*	*	Equal
Boston-Shannon	-	*	Foreign
Boston-London	1	1	Equal
Boston-Frankfurt	-	1	Foreign
Boston-Paris	1	*	TWA
Boston-Zurich	-	*	Foreign
Boston-Milan	-	1	Foreign
Boston-Rome	-	*	Foreign
Philadelphia-London	-	1	Foreign
Washington-London	-	1	Foreign
Chicago-London	1	1	TWA (747)
Chicago-Frankfurt	-	1	Foreign
Chicago-Milan	-	1	Foreign
Los Angeles-London	1	-	TWA
Los Angeles-Paris	-	*	Foreign

* Less than four trips per week.

CHART 4

TWA TRANSATLANTIC PATTERN

AVERAGE DAY - SUMMER 1972

<u>Route</u>	<u>Nonstop Daily Frequency</u>
New York-Shannon	1
New York-London	4
New York-Frankfurt	1
New York-Paris	2
New York-Geneva	1
New York-Zurich	1
New York-Milan	1
New York-Lisbon	1
New York-Madrid	1
New York-Rome	2
New York-Athens	1
Boston-London	1
Boston-Paris	1
Philadelphia-London	1
Washington-Paris	1
Chicago-London	1
Detroit-London	1
Los Angeles-London	1
Total	<hr/> 23

Note: Excludes three segments which had less than four flights per week.

CHART 5

TWA VERSUS FOREIGN FLAG COMPETITION

IN B-747 SERVICE, SUMMER 1972

Routes Where TWA and Foreign Competitor Both Operate 747

New York-London	New York-Madrid
New York-Frankfurt	New York-Rome
New York-Paris	Chicago-London
New York-Lisbon	

Route Where TWA Operates 747, but Not Foreign Competitor

Los Angeles-London

Routes Where Foreign Competitor Operates 747, but Not TWA

New York-Shannon	Boston-London
New York-Geneva	Boston-Milan
New York-Zurich	Boston-Rome
New York-Milan	Chicago-Frankfurt
New York-Tel Aviv	Los Angeles-Paris
Boston-Shannon	



DEPARTMENT OF
TRANSPORTATION

OFFICE OF THE SECRETARY

WASHINGTON, D.C. 20590

N73-32902

NEWS

REMARKS BY ROBERT HENRI BINDER, DEPUTY
ASSISTANT SECRETARY FOR POLICY AND INTERNATIONAL
AFFAIRS, DEPARTMENT OF TRANSPORTATION, BEFORE
THE FLIGHT TRANSPORTATION LABORATORY OF
MASSACHUSETTS INSTITUTE OF TECHNOLOGY- JULY 21, 1972
WATERVILLE, NEW HAMPSHIRE

"INTERNATIONAL AIR TRANSPORT AND FEDERAL POLICY"

I am pleased to be a part of this afternoon's seminar on
International Air Transport and Federal Policy. I see from the program
that you will be hearing not only from the Executive Branch of the
Federal Government but also from the Civil Aeronautics Board and
from the U.S. side of the industry.

International air transportation is somewhat unique from a
policy standpoint. A Statement of International Air Transportation Policy
was approved by the President in 1970, replacing an earlier statement
of several years prior vintage. This new Policy Statement is taken by
the Executive Branch and other parts of the Federal Government as
establishing policy guideposts for future U.S. participation in the
international air transportation industry.

For our purposes this afternoon I think it would be useful to use the 1970 Policy Statement as the backdrop for my remarks. Given the two years since the Policy Statement was approved, it's appropriate to take a look at what has happened in the intervening years, whether the policy has been effectively implemented, and whether there are particular problems or developments which should now be taken into account. My staff in the Department of Transportation recently completed a preliminary review of the implementation of the Policy Statement during the last two years, and I have included this in the materials I have distributed today. You may find it a useful context for my remarks and a possible basis for your questions.

The 1970 Policy Statement covered a number of policy issues. I do not intend to touch on each of them in my opening remarks this afternoon, although I will be happy to try to respond to questions on any aspect of the Policy Statement.

Rather, I would like to concentrate this afternoon on the 4 or 5 issues that I think are of greatest current concern, and which may serve as the best focus for discussion during the next hour or so.

I. A policy issue of the highest priority for the Federal Government at this time is the question of aircraft hijackings, both domestic and international. In 1970, the Policy Statement noted that the purposes of the Policy Statement overall could not be realized until aircraft hijackings are stopped. It went on to say that by any standard air piracy is reprehensible, and that we support measures designed to end this terrible practice. It may be useful for you to have a tabular description of the pattern of international conventions which have been negotiated to deal with the threat of aircraft hijacking. I have had such a table prepared and it is included in the papers I have distributed. We are now actively seeking to add to this group of conventions further international agreement on sanctions to be applied to a nation that refuses to extradite or prosecute a hijacker, or otherwise flouts internationally standards of conduct.

President Nixon has assigned to the Secretary of Transportation the responsibility to coordinate the Government's overall program in this area, and to the Department of State the responsibility for coordinating the international aspects of it. Pursuing these responsibilities, Secretary Volpe proposed to the ICAO Council in December of 1971 that agreement be reached to apply a boycott to nations that refuse to extradite or prosecute a hijacker. Although the ICAO Council at that time adopted the proposed resolution, progress has not been satisfactory within ICAO, and the United States has called a meeting of the concerned nations in September of this year to make another strong effort to accomplish international agreement in this important area.

II. The relationship of scheduled services and charter services.

Perhaps the most contentious feature of the 1970 Policy Statement was its treatment of the competitive relationship between charter services and scheduled services. In the years preceding the 1970 Statement of Policy, charter services had begun to become an important feature of the international air transport market, largely brought on by the competitive pressures of the supplemental carriers who had been granted certificates by the CAB to engage solely in charter operations. It had always been true, you should understand, that scheduled operators were free to engage in charter operations both on the routes where they operate scheduled services and to some extent even off those routes. But these charter rights of the scheduled operators had not been exercised to any substantial degree until the supplemental carriers - charter specialists - began to aggressively develop the market for this type of air transportation.

A moment ago, I characterized this section of the Policy Statement as the "most contentious." This was because it was taken wholly accurately, to be an endorsement of charter services. And there is clear language in the Policy Statement which finds value in charter services - whether those charter services are operated by scheduled operators or by supplemental carriers or other charter specialists.

As the Policy Statement puts it "charter services by scheduled and supplemental carriers have been useful in holding down fare and rate levels and expanding passenger and cargo markets. They offer opportunities to exploit the inherent efficiency of planeload movement in the elasticity of demand for international air transport. They can provide low cost transportation of the sort fitted to the needs of the significant portion of the traveling public. Charter services are a most valuable component of the international air transportation system, and they should be encouraged."

This is not to say that there was not an even stronger endorsement of scheduled services in the Policy Statement. What was significant about the 1970 Policy Statement was that it gave as much recognition to charter services as it did, for this marked a departure from the prior policy statement that had been adopted under the Kennedy Administration. As far as scheduled services were concerned, the Policy Statement had quite a bit to say: "scheduled services are of vital importance to air transportation and offer services to the public which are not provided by charter services. Only scheduled services are expected to offer regular and dependably frequent schedules, and provide extensive

flexibility in length of stay, and maintain worldwide routes, including routes to areas of low traffic volume. Substantial impairment of scheduled services could result in travelers and shippers losing the ability to obtain these benefits."

Given this recognition that both types of services had value to the traveling public, the Policy Statement concluded that each type of service should receive appropriate government protection if the service was threatened with substantial impairment.

Another aspect of this part of the Policy Statement deserves note. It was quite explicit in the constraint that should be put upon government interference with the use and growth of charter services. As the Statement put it: "The widespread public acceptance of charters warrants care in taking any restrictive actions. A determination whether to impose restrictions upon charter services should consider principally the extent to which the ability to obtain frequent and regular travel would otherwise be prejudiced. If it is necessary to restrict charter services (because of their impact on scheduled services), the restrictions should be the minimum necessary to have the required effect."

I would not be overstating the case to say that the relationship between scheduled and charter services continues to be one of the key, if not the dominant competitive question in international air transportation today, certainly across the North Atlantic, and in other markets as well.

Before discussing these issues, it might be useful to do so in the context of some statistics which show how these markets have grown. A table which I have included in the materials that I have distributed traces the growth of the charter and scheduled markets from the years 1968 through 1971, and shows to what extent the charter growth is attributable to supplementals and to other charter operators whether they be IATA members or foreign charter specialists.

Let me say a word about this chart. It would be wrong to think that all of the so-called bulk transportation market travels on charter services. For some years now, the scheduled carriers have offered fares that are aimed at attracting groups of scheduled passengers, often at rates which are directly competitive with charter rates. Consequently a substantial part of the traffic on scheduled services as shown on this chart includes the kinds of passengers who would also be interested in flying on a charter flight, and indeed might well be flying on a charter flight but for the competitive aspects of the service and price offered by scheduled operators. Naturally, the converse is true: many charter passengers might well prefer scheduled service, given

an equivalently low price. And the Policy Statement recognizes these relationships, and states that: "Both scheduled carriers and supplemental carriers should be permitted a fair opportunity to compete in the bulk transportation market."

There is something striking about the growth of the charter markets. Notwithstanding the impressive upward slant over the past several years, it has taken place in the face of a tremendous variety of governmental restrictions, all designed to keep this growth under check.

We have recently had occasion in the Department to make a summary of the different ways that we and other governments have chosen to restrict the use of charter travel, and I have included that tabulation in your materials as well. They vary from outright prohibition on charter flights to explicit numerical quotas on the number of charter flights that may be operated into a country (generally these prohibitions and limitations are addressed at the charter specialist. As I indicated earlier, on-route charter operations by scheduled operators are generally allowed without restriction by governments). Other restrictions have to do with the quality of service that you can offer, or the number of stops you must make, or the price that you must charge, or the relationship between the passengers that must exist before they can travel as a group.

The differences between these existing restrictions, many of which predated the 1970 Policy Statement, and the teachings of that Policy Statement, are rather clear. That Policy Statement puts at issue the continuation of any such restrictions unless they can be justified and shown to be necessary to protect or preserve the convenience that only regular scheduled service can provide. Yet I am frank to say that virtually none of these restrictions have ever been justified in these terms, and indeed I would venture to predict that not many of them would survive such an exercise.

Since 1970, there have been a number of moves within the Federal Government to implement the teachings of this part of the Statement. On the international diplomatic front, the State Department has taken the fruits of an interagency drafting effort and attempted to interest countries in negotiation of bilateral charter agreements, agreements that would provide for the regular operation of charter services.

On another front, efforts have been made to identify what it is about the operation of scheduled services that is entitled to governmental protection, or that would serve as the justification for the restrictions on charter services that are now maintained by so many governments. This is the effort to identify what aspects of scheduled services, or what level of scheduled operations, should be protected from substantial impairment, consistent with the public interest, within the meaning of the President's Statement of Policy.

Our progress in this front has not been encouraging. The Department has proposed on several occasions to the Civil Aeronautics Board that an investigation be instituted that would address this issue, and upon which appropriate regulations might be based to apply whatever justifiable restrictions on charter services were found to be warranted. The Board has not instituted any such investigation. Indeed, before Congress recently, the General Counsel of the Board testified that he thought that such an investigation would be fruitless. I am not sure I fully understand that testimony. If he was suggesting that there is no way to identify what it is about scheduled service that the government should protect, I don't understand how we can justify any restrictions on charter services, at least in a priori sense. If the Board is saying that damage to scheduled service can only be measured on an ex post facto basis, then restrictions should be lifted until their reimposition is justified. Or experiments should be tried, where their impact could be measured.

As we see it, all restrictions on charter travel are tools to be applied to achieve an objective. Unfortunately, it's easy to become fascinated by the manipulating and sharpening of the tools. We believe we should first concentrate on exactly what it is we want to achieve, and then select the tools to do the job. Relevant to this issue, we do have the view of the Board on the issue of substantial impairment, at least as far as prior years are concerned. In the recently released decision of the Board concerning renewal of transatlantic supplemental certificates, the Board found that there was no substantial impairment of scheduled services for the years up to and through 1970. This conclusion of the Board appeared to be based upon findings that there had been no diversion of traffic or revenue from scheduled services, notwithstanding the strenuous arguments of the scheduled airlines in that case that substantial impairment had indeed taken place.

Apart from CAB proceedings, the Executive Branch is currently engaged in discussions with European countries in an effort to identify on a statistical basis what level of scheduled operations does represent the minimal desired level of scheduled service in the public interest,

and the relationship of various charter concepts and rules to such a minimal level. If this level can be identified and agreed upon, we believe it will serve as a benchmark for the application of appropriate restrictions on charter operations to the extent that those charter operations appear to threaten the maintenance of that level of scheduled operations.

Should this benchmark be identifiable, we would expect it to be of value in conjunction with the negotiation of bilateral agreements concerning charter operations. Indeed, it is my view that the identification of such a benchmark would facilitate negotiation of such charter agreements, because both sides would be able to understand that amount of characteristics of scheduled service they are concerned about protecting from substantial impairment.

I should mention another aspect of the regulatory scene which bears on all that I have said. Both on this side of the Atlantic and the other, there is a gradually awakening disaffection with the concept of affinity charter regulations. That is, requiring that the people traveling in a charter group bear some pre-existing relationship or affinity to one another, by reasons of their common membership in some group that was formed for purposes other than qualifying for air travel. This concept has proven very difficult to enforce, and to the extent it was developed to constrain charter travel, it obviously has not worked very well. Consequently our Civil Aeronautics Board has proposed and is now considering another way of regulating charter travel, which would not apply the affinity concept, but instead would apply certain restrictions to the charter traveler in terms of how long before the flight the ticket must be purchased, how much of a down payment must be made, how much of the down payment is forfeited if the traveler decides not to go on that flight, etc.

In Canada and Europe, too, there is disaffection with the affinity concept and a desire to move to some excursion travel charter regulation which also would deal with the advance purchase and down payment features and other elements of the trip. Other countries share our view that the affinity concept is inherently discriminatory, and unjustifiably denies to many the benefits of low-cost charter travel.

I think it's fair to say that our objective is that a non-discriminatory charter concept be developed which is open to widespread use. To the extent this concept becomes a substitute for the affinity rules, our regulations and the European regulations should be harmonious. I would

also say that in terms of our Policy Statement, the restrictions on the use of this type of charter - that is the advance purchase requirement, and the amount of the down payment, and other requirements all should be tailored in the light of whatever protection of scheduled service it is felt is necessary to be accomplished by such restrictions. Thus these conversations that we're having with the European governments may have an additional potential application. They may serve as a basis upon which both the Europeans and ourselves can structure new charter regulations as to avoid undesirable impacts on scheduled service and yet allow the greatest feasible use of the new charter authority for the benefit of the traveling public.

Before leaving the question of charter and scheduled competition, let me say a word about a current problem which the members of IATA have before them now. This is the proposal that would allow scheduled carriers to fill their unused capacity with small groups of charter passengers. This is a proposal that has been made by Pan Am and by perhaps some other scheduled operators, and is the subject of an IATA meeting that has been ongoing in Europe for some time. We've been besieged with views pro and con about this proposal. From the scheduled carriers we've heard that it's a desperately needed financial boost to their revenue position, and makes economic sense because the space on their scheduled flights that is involved would otherwise be unused. From the charter specialists, the supplementals, we've heard that this type of charter operation by scheduled operators would have a disastrous impact on charter specialists because it would siphon away from planeload charter operations many groups of charter travelers that would otherwise be grouped in planeload lots by charter organizers. From the standpoint of the traveler, which we like to make our principal focus, the proposal can be defended. It does make available to the charter traveler the facilities and the quality of the service provided by scheduled operators, and so long as the fare is commensurately low, it appears to offer an advantage. But we have not been able to sort out the effect of the use of this device on the competition between the scheduled and charter operators. There is much to be said for letting the market work its will, but the supplementals contend quite vigorously that this is an unfair competitive device. Once used to put the supplementals out of business, they argue, the scheduled operators' interest in charter operations will cease, all to the eventual disadvantage of the traveling public. The Policy Statement does warn us that the government should not allow enjoyment of the right to perform both scheduled service and charter

service to result a decisive competitive advantages for scheduled carriers. Therefore we have to consider whether this would be a decisive competitive advantage, and we do not yet have the facts at hand that would give us the conclusive answers to these questions. We understand that the Board has told the scheduled carriers that any such fare in their new fare package would lead the Board to institute a thorough investigation of the pros and cons, and we tend to agree that the issues raised by such a proposal would warrant a thorough factual investigation.

III. Capacity problems. As the Policy Statement makes clear, our basic policy position is consistent with that which the U.S. maintained for many years. That is, there should be no pre-existing capacity constraints upon the capacity offered by ourselves or foreign airlines operating scheduled services to or from the U.S., and that any difficulties that may arise with respect to excess capacity in the market should be resolved on an ex post facto basis. This principle can be said to be the keystone of the so-called Bermuda principles, and indeed distinguishes the bilateral airline relationships that we have with other countries from that which most foreign countries have amongst themselves. The practice abroad is very much predeterminism, with each country agreeing or arranging with others in advance as to the amount of airline capacity to be operated in particular market pairs.

Over the years the pressures on us from other countries to erode the Bermuda capacity principles have been continuous, and these pressures are as strong today as perhaps they ever have been. Perhaps in response to these pressures, the Policy Statement states, forthrightly, that "attempts to restrict U.S. carrier operations abroad should be vigorously opposed, and where required, the United States should take appropriate measures against the carriers of foreign countries restricting U.S. carrier operations." Consistent with this mandate, we have recently armed ourselves with a regulatory weapon to resist foreign restrictionism. After a number of years of debate as to the form of the appropriate regulation, the CAB has adopted Part 213 of its economic regulations which enables the Board to react to foreign restrictions by requiring that the foreign carrier file its own schedule of operations with the Board, subject to disapproval by the Board, which itself is subject to Presidential review and veto. A similar regulation has been proposed which would apply to restrictions of charter operations. I am pleased to say that this retaliatory authority is not a paper tiger. Some time ago, the Board exercised it in the case of Australia. More recently, the British Government's restriction of National Airlines' frequencies from Miami to London has led the CAB to call for the filing of BOAC's schedules under Part 213. The end of this particular story is not yet written, and perhaps Charlie Butler will want to comment upon it when he speaks to you later today.

The potential measures that this country might consider to further protect the Bermuda principles are worth some thought. Certainly, in a period of general excess capacity, the Department of Transportation would be interested in carrier proposals to agree upon some reduction of operating capacity. This is a principle which has already been found beneficial when applied to our domestic transcontinental operations, as well as operations from New York to Puerto Rico. Given adequate economic justification for such arrangements, we would be interested in at least examining a proposal for some comparable arrangement concerning international routes.

Another practice which has been found to be a useful adjunct to the maintenance of Bermuda principles, is called pre-screening. This involves the review by the United States Government of schedule changes by various American airlines, before the change is put into effect, to consider whether the changes might be the subject of some foreign protest on the ground of excessive capacity increase. Historically, the government has resisted putting itself in this posture with respect to our own airlines, but I think it's clear that on some occasions our own airlines have proposed capacity increases which cannot be defended in terms of economic projections, and which have led to unfortunate strains on the maintenance of our Bermuda principles. I wholly agree that management discretion should control, at least in the first instance, with respect to the type and quantity of service that is provided in a market. On the other hand, economic opportunity should carry with it certain responsibility, and when a carrier appears to disregard such responsibility, it's appropriate for the government to think of ways to encourage the exercise of it.

IV. Rate regulation. The President's Policy Statement generally calls for a continuation of our acceptance of IATA as the machinery for pricing scheduled services, and also recommends vesting the U.S. Government and the Board with authority to regulate rates and fares between the United States and foreign points, subject to executive review. Within the present Congress, such authority was granted to the CAB, and I have included a print of that public law in the papers which I have distributed. During the discussions before the Congress on the shape of this new legislative authority, Department of Transportation urged on behalf of the Administration that the Board's regulatory standards be constrained, narrowly defined, and cost-related. Congress agreed that the Board's powers be constrained, and specified that the Board could suspend and disapprove international rates, but not fix them. With respect to the regulatory standards, however, the Congress

rejected our approach, and chose instead to incorporate the Board's domestic regulatory standards, and also the principles that are found in standard bilateral agreements. Consequently, I believe it will be a considerable time before we see a pattern of the Board's regulatory rationale under this law, largely because the exercise of the power should be relatively rare.

We have on a number of occasions urged that air fares be related to costs. This was the thrust of the Department's testimony before the Board in the General Passenger Fare Investigation. It was also the basis of the Department's analysis last year of certain fares proposed by Lufthansa; that analysis was given to the Congress as part of my testimony on the air fare bill. And our interest in cost-related rates is not confined to air fares. It has served as one major rationale for the Administration's proposals to the Congress to amend the Interstate Commerce Act concerning the regulation of domestic surface transportation. A major unresolved issue concerning air fares that faces the international airline industry and governments today is the extent to which fares should be required to have a particular relationship to cost.

In the charter market, for example, fares are now set entirely by market competition; there is no existing industry group like IATA to set the fares, and there is no widespread governmental control of charter fares. One issue which we are considering now is whether there is a need for a cost floor under charter rates. The continuing increase of charter operations across the North Atlantic may be creating sufficient competitive pressures to drive the level of the rates below an economically sensible level. Given our general concern that transportation rates should not be allowed to be pushed by competitive or other forces below an appropriate cost level, we are giving some thought to identifying the current relationship between charter rates and costs, and considering ways in which an appropriate cost floor might be identified and applied to the level of charter prices. From the travelers' standpoint, this might prevent charter rates from sinking as low as the travelers might prefer. But we have never thought that the long-term interest of the traveler would be served by below-cost carrier operations. I might add that I do not view what I have just said as inconsistent with that part of the Policy Statement that states that "continued

support should ... be given to the establishment of IATA and non-IATA charter rates on a free competitive basis." I have not suggested that charter rates be fixed; only kept from sinking to undesirable levels.

V. In conclusion, let me summarize my impression of the implementation of aspects of the President's Statement on International Air Transportation Policy over the last two years.

In certain areas, where the Policy Statement took a new posture, there has been impressive implementation. I think particularly of the call in the Statement for additional CAB authority to regulate international air fares - that law has been passed and signed by the President. I think also of the call to this Government to react vigorously to foreign efforts to restrict our air carrier operations. And with respect to the adoption and application of Part 213 of the Board's regulations, as well as proposed action with respect to the service of Irish airlines to New York, this Government has shown that it is prepared to back that policy thrust.

With respect to other major elements of the 1970 Policy Statement, the record of implementation is not as bright. The Policy Statement urged us to vigorously seek intergovernmental agreements covering the operation of charter services. Without passing on the vigor of this effort, no such agreements have yet been reached. (But we are pressing forward, and such agreements may be reached soon.) The Policy Statement commanded us to prevent the substantial impairment of scheduled services and charter services. While I am prepared to agree that this impairment has not taken place in the last two years, we have not yet fully identified the criteria of such impairment, so that we will be able not only to recognize it after its taken place but also prevent its occurrence if it appears to be threatened. (Our talks with the ECAC countries may shed some light in this area.) And I am afraid to say that the injunctions in the Policy Statement concerning improvements in the structure of IATA fares have not yet borne immense fruit. (But the new law under which the CAB can regulate international fares may lead to such improvements).

So we have made substantial progress in the implementation of the 1970 Policy Statement. And we have more yet to do.

I would hope that all of you will consider it a responsibility to follow the course of this implementation, and let us know how you think it is progressing - particularly when you think it is not progressing fast or far enough.

Remarks of James E. Landry and Gabriel Phillips
Before the MIT/NASA Aviation Workshop
Waterville Valley, New Hampshire
Friday, July 21, 1972

United States International Air Transportation Policy --
The Promise and The Reality

(Landry)

Ladies and gentlemen, I believe the program has already succeeded in introducing the two of us to you and, for that reason, we can no doubt dispense with the formalities of telling you who we are. Perhaps it would be useful to explain briefly why we are here participating in this Workshop and most particularly, on today's agenda. Clearly everyone on this afternoon's program was brought here to discuss a single subject -- this country's international air transportation policy. And obviously, the gentlemen who spoke here this morning have in the past been most instrumental in formulating the policy now in effect.

In short, you have heard today from those who by authorship or assignment have a measure of allegiance to our government's international air transport policy. We have come here as two representatives of the scheduled airline industry whose work over the past several years has entailed living with, or perhaps more accurately -- coping with that policy. We are not here with an official statement of industry position on the subject, although to be sure much of what we will say is consistent with publicly espoused views of the scheduled airlines. We want to discuss some of the

things which from our experience we consider to be wrong about that policy. And, we would like to take advantage of the unique opportunity which this forum provides to raise some questions concerning a few of the sacred cows of U.S. international aviation policy down through the years. I hasten to say that we have not crept among you as iconoclasts in establishment clothing -- but an idyllic setting such as this and our placement on the program suggest that we have one last clear chance to catalyze thought toward resolution of what has seemed irresolvable.

The major departure in this Policy Statement from its predecessor is in its discussion of the relationship between scheduled and charter services. The previous statement, reflecting the absence of charter services as a significant element in international air transportation, made no mention of the proper role of such services. The new statement, in sharp contrast, carved out a whole new role for charter services and a new fertile field for controversy in international aviation relations. It was no doubt predestined to be controversial. First of all, it is a subject matter never before dealt with in any international policy statement. Secondly, it is a subject matter which was debated long and strenuously in the halls of Congress by representatives of the scheduled and supplemental carriers. Thirdly, it is a subject matter on which the representatives of the various agencies involved in the policy review held differing

and in some cases deep convictions. The product was of course a compromise or, as some critics have termed it, a waffle -- a waffle that says all things to all people. The end result is a shambles.

The pious and naive hopes of its drafters have produced a situation where international travel, particularly across the North Atlantic, has continued to expand rapidly. But, the expansion has not been a healthy one. Charter operators are going broke; scheduled operators are losing money and the legal regime which governs operations is more chaotic than ever.

I will address the capacity aspects of the charter policy, and Mr. Phillips will speak to the other competitive aspects -- entry and rates. Needless to say, in the real world they are all interrelated, although government administration mistakenly deals with them as separate items.

In discussing capacity, I would like to pinpoint one sentence from the charter section of the Policy Statement and the extraordinary proposals which have been built upon it. The sentence I refer to states "In any instances where a substantial impairment of scheduled services appears likely, it would be appropriate, where necessary to avoid prejudice to the public interest, to take steps to prevent such impairment." Mr. Binder has suggested that this constitutes a mandate upon the government to determine the level of scheduled service which is entitled to government protection. To arrive at this essential level of scheduled service, Bob

further suggested that the standard might take as its base the number of travelers using scheduled service at normal fares in a given base year, plus some proportion of the number of downward diverted discount fare passengers. More recently, Dr. Cherington built upon the proposal by Mr. Binder by suggesting that a route-by-route tabulation of the minimum scheduled service required was not a workable approach and proposed that a generalized rather than a detailed yardstick be utilized, such as setting as the minimum requirement the availability to individually-ticketed passengers of a number of seats equal to 160 per cent of the individually-ticketed passengers in the preceding year, handled by all scheduled carriers plus an allowance for growth of 10 per cent. The base number of passengers would exclude GIT and other low fare excursion passengers handled on scheduled aircraft.

Dr. Cherington added that further refinements might include some allowance for seasonality on the route. When constructive load factors for all carriers on a route drop below 50 or 55 per cent as related to the base requirements, Paul suggests that the Civil Aeronautics Board could unilaterally cut back on permitted charter flights by U.S. supplementals affecting that route and if the reciprocal country did not take similar action with respect to its charters, the Board could, perhaps after consultation, also curb foreign flag charters. Lastly, Paul suggested that,

if during a period of one or two years of study of the minimal scheduled capacity requirements, it appeared necessary to provide a greater measure of protection for scheduled service, the minimum standards could be tightened accordingly. And, as the frosting on the cake, Paul argued that uncontrolled carriage of GIT or low excursion fare passengers on scheduled flights might be used by the scheduled carriers to drive charter operations of any type from the market except in the peak season and the Board should therefore have the authority to limit or curtail the amount of capacity offered to low fare passengers on scheduled flights.

Let me tell you why we feel these proposals are dead wrong, both as a matter of law and as a matter of policy. Congress in 1938, after several years of strenuous debate and careful deliberation, enacted the Civil Aeronautics Act -- providing a statutory framework for the sound development of a national air transportation system built upon the concept of regulated competition. Down through the years, Congress cautiously reviewed and updated that Act on many occasions. But throughout the process, Congress prudently maintained a regulatory philosophy which embodied these basic principles: first, competition to the extent necessary in the public interest, secondly, controlled entry, and thirdly, no government regulation of scheduled frequency.

Yet, when the Administration issued its Policy Statement in June of 1970, it promoted a new and ambiguous standard for regulating competition in the public interest as it construed that philosophy, namely,

"substantial impairment." The Administration borrowed this concept from the capacity provisions of scheduled service bilateral agreements, which guard against an undue effect upon a competing carrier. I do want to say, parenthetically, a few words about Bob Binder's discussion earlier today of the letter exchange between the President and the Civil Aeronautics Board concerning the recent Transatlantic Supplemental Renewal Case decision. He suggested that it was improper for the Board to attempt to cut down the number of entrants from six to five without a finding of substantial impairment. I would suggest that the Board was looking to the consideration that there should be "competition to the extent necessary....," a key element of Section 102 -- the cornerstone provision of the Act. In other words, without presuming to declare who was right and who was wrong in the decision, it seems to me that the Board was attempting to follow the law, perhaps not necessarily the Policy Statement.

In proposing a determination of the minimum level of scheduled service required, Mr. Binder and Dr. Cherington were suggesting that the rest of our air transportation needs could be taken care of by obligation-free, hit-and-miss, so-called "bulk air transportation" operations. The irony is that the clear Congressional intent was to build an air transportation system upon a firm foundation of scheduled service, and supplement it with such charter operations as required. Implicit in the Congressional purpose was a mandate to the Civil Aeronautics Board to assess the maximum

need for supplemental service, not the minimal need for scheduled service. Indeed, the Congress very purposefully forbade the Board from controlling the frequencies of a scheduled airline, or its selection of equipment. However, in order to insure that supplemental air transportation remained just that, the Congress specifically empowered the Board to exercise those controls over the supplemental airlines. Not only has the government never implemented this power, but the Cherington and Binder proposals would move in the opposite direction.

Again if I may digress for a moment, I was interested in the comment of one of your gentlemen a few minutes ago suggesting an analogy between the establishment of a minimum level of scheduled service and the Board's stand on the specific level of service required to small communities. It seems to me that what Congress did was ordain for the latter area substantial governmental intrusion into the areas of managerial prerogative which are so fundamental to our free enterprise system. Congress did this because of the federal subsidy supporting this service. The rationale was that Congress should control, through its arm -- the Civil Aeronautics Board, the expenditure of public funds. There is no federal subsidy involved in the trunkline service for which the Department of Transportation seeks to find a minimum essential level, and that is a critical distinction.

CS

CS

Now If I may go back to the basic train of our presentation. I have talked up to this point about what the law presently provides. But obviously, and I am sure Bob Binder would be among the first to point this out, the law will not serve society if it will not change to accommodate society's changing needs. Let us examine then whether the law should be changed as a matter of policy. As I mentioned, Bob first proposed in somewhat vague terms that some proportion of the number of discount fare passengers carried on scheduled service be included in the essential service base. Dr. Cherington, testifying on behalf of the supplementals in a Congressional hearing, suggested a total exclusion of this volume of passengers in the measurement. In short, both proposed that inevitably the amount of low fare service offered on schedules would be restricted, forcing those passengers into charter movements by either class of carriers.

The question is what part of the public could possibly benefit from such a policy. Not low fare passengers, for they would be limited as to the amount of scheduled service opportunities they would now find available. Some would find themselves forced into charters, whether they wanted that form of travel or not -- with the inherently greater restrictions on when and how they could travel, assuming they could establish charter eligibility in order to find any low fare outlet whatsoever. I am not talking about a handful of passengers -- in 1972 across the Atlantic alone, the scheduled carriers will be carrying some 6.5 million passengers meeting

this low fare description. In a predictable competitive response, the charter proponents now propose to shut out flexible low fare opportunities for a substantial portion of the market.

It would follow, perhaps, that if the discount fare passengers would not stand to benefit from the proposals of Messrs. Binder and Cherington then at least the full fare passengers might. They would not, and could not. If I could leave no other impression here, I would be satisfied if there could be a better understanding that the scheduled industry has been successful in developing an integrated, full service scheduled system since World War II because all sectors of the traveling public mutually reinforce the economic viability of this system as a whole, and therefore each part of the market benefits from the existence and support provided by the other parts. In other words, the ability to carry the business traveler, the government traveler, the military passenger, the vacationer, the youth passenger -- all on the same scheduled flight enables the industry to provide better service, better equipment, and a lower average fare to the entire public, than would be possible if major parts of these markets were segmented away from the scheduled system.

The supplementals, borrowing from economic purists, argue that the full fare passenger subsidizes the discount fare passenger. To the contrary, discount fare passengers fill the seats and produce the revenues which enable the carriers to offer the range and volume of services which

everyone including the full fare passenger enjoys. Without them, our industry could never have moved successfully into the first jet era, nor could we now support the large capacity jets of this generation of equipment.

Without the revenues from discount fare passengers, we would have to charge full fare passengers higher fares. Despite the contention that premium fare passengers are price-inelastic, experience demonstrates that when a substantially higher fare is introduced, the fewer the passengers willing to pay it. The formula partially adopted by Mr. Binder and fully advocated by Dr. Cherington would thus lead to constantly decreasing levels of "protected" scheduled service. As the ability to carry both business and pleasure travelers on scheduled flights was restricted, the number of those scheduled flights would be reduced and many transatlantic markets, for example, could no longer support even daily service with conventional jets and might be forced to once-a-week service or less with 747's.

I understand that Mel Brenner offered you an analysis the other day of what could happen to the New York-Paris market, for example, applying the Cherington formula, finding that the so-called "essential" level of service would be one 707 every two or three days or one 747 every five days for most of the year. The Bermuda-type agreements, which we have long fought to preserve with our foreign partners, would

not permit us to unilaterally restrict the service offerings of our foreign flag competitors. You can imagine then what Air France would do to our carriers' market participation with their twice daily 747 offering.

Before leaving the subject, I might mention that the Cherington proposal in particular gives no weight whatsoever to the value of scheduled service to the movement of freight and to the postal service -- key considerations in the determination of the public interest called for under the cornerstone of the Federal Aviation Act, Section 102. The fact that only the scheduled industry has the legal authority, the facilities and the total system to meet the needs of all parts of the air travel and air freight markets -- the fact that only the scheduled industry is equipped to provide the full service required in the national interest is not to be taken lightly. The proposals of Mr. Binder and Dr. Cherington would leave large parts of the public with less good service, or higher cost service, or both. They should be summarily rejected.

As I said at the outset, Gabe is going to address the other competitive aspects, dealing with entry and rates.

(Phillips)

Mr. Landry cited only one relevant sentence from the charter section of the Statement. There are several other pertinent provisions which are appropriate in this context. Let me quote a few:

"While the roles of scheduled and supplemental carriers are different as described in this Statement, there has nonetheless developed in certain areas competition between them. This may, indeed, increase."

* * *

"Charter services by scheduled and supplemental carriers have been useful in holding down fare and rate levels and expanding passenger and cargo markets. They offer opportunities to exploit the inherent efficiency of plane-load movement and the elasticity of demand for international air transport. They can provide low-cost transportation of a sort fitted to the needs of a significant portion of the traveling public."

* * *

"Additional uniformity and simplification of charter rules is desirable, and an effective charter enforcement program should be maintained."

* * *

"Both scheduled carriers and supplemental carriers should be permitted a fair opportunity to compete in the bulk transportation market."

* * *

"Licensing tools (geographic limitations, charter definitions, volume restrictions, etc.) can be utilized to adjust the competition between scheduled services and charter services."

* * *

"The foreign landing rights for charter services should be regularized, as free as possible from substantial restriction. To accomplish this, intergovernmental agreements covering the operation of charter services should be vigorously sought, distinct, however, from agreements covering scheduled services."

* * *

This is a recital of the promise of the Policy Statement. Let's look at the realities. One place where the promise ignores reality is in failure to recognize that the international air transport passenger market is one market. Today, over the North Atlantic -- the world's preeminent international passenger route, only 30 per cent of scheduled service passengers

move at first class and regular economy fares. The remainder move at promotional fares of one kind or another. Just five years ago, nearly 55 per cent of scheduled carrier passengers moved at first class and regular economy fares. Clearly the proportion of premium fare passengers is dwindling.

Yet the Policy Statement attempts to assign as the preserve of charter services the bulk transportation market. This can represent as much as 70 per cent of the current scheduled carrier traffic across the North Atlantic and of course all of the charter traffic across the North Atlantic, or roughly eight out of every ten passengers.

Who would be entitled to operate charter services for this bulk transportation market? Today, there are seventeen foreign and three U.S. scheduled operators. Additionally, there are six U.S. supplementals and twenty-three foreign charter specialists so authorized.

Now the Policy Statement calls for regularization of charter services through the establishment of intergovernmental agreements. Additionally, the Statement calls for uniformity and simplification of charter rules and an effective charter enforcement program. It also states that licensing tools can be utilized to adjust competition between scheduled services and charter services. But there simply will not be an international legal regime for charter services under present circumstances. Why?

- There are too many operators.
- The competitive structure is too irrational.
- Neither the United States nor its prospective bilateral partners have come to grips with the rules of the game.

Let's look at these problem areas. The pattern of scheduled services is built on a foundation where U.S. operators obtain certificates of public convenience and necessity which specify the permissible scope of operations by means of linear routes with specified terminals in the United States and abroad. The certificates are granted in complex licensing proceedings where careful consideration is given to the needs of the traveling public in specified markets, traffic flow projections, likelihood of profitable operations, competitive impact. This operating permission is then implemented through a series of bilateral agreements which also carefully define the routes being exchanged specifying the terminal and intermediate points. A careful balance is drawn between the economic opportunities available to the one side and the other. Reciprocity is thus formally and rationally established. Of course, in order to obtain access for U.S. carriers to Ireland and the United Kingdom, France, Germany, Italy and all the countries in Europe, access to the United States is given to airlines of each of those countries. Thus, the seventeen foreign scheduled operators and three scheduled U.S. operators across the North Atlantic.

In the charter service area, there are as yet no bilateral agreements. The United States seeks to obtain landing rights for its charter specialists by granting foreign operators permits willy-nilly in the hope that the foreign government will reciprocate. Needless to say, the system doesn't work very well.

The reality is that the same pattern for charter service bilaterals is neither necessary nor desirable, but the United States Government has failed to recognize this. The six U. S. supplemental carriers were given blanket authority to serve any points in the United States and any point in Europe. No single European country is going to allow six U. S. carriers with identically broad authority to serve from any point in the United States and at the same time be faced with U. S. scheduled operators--three in the case of the United Kingdom and two in other major European countries. They, unlike the United States Government, have some concern for not only the impact on scheduled services but the overall competitive impact on their national carrier.

The way to bring order out of this arrangement is for the United States first to recognize that it need not have six U. S. charter specialists operating in the same market even if charter services are to become the dominant mode of travel in the future. If the United States were to reduce the number of charter specialists through a more careful definition of the countries in Europe or of the geographical area in the United States which

each could serve or a combination of both, foreign governments would be faced with a more acceptable competitive environment. Secondly, the United States ought to recognize that the European market is a homogenous one, and its requirements are more than adequately served if entry is secured at three or four key gateways in Europe. With this recognition, the United States can seek to limit the number of European operators to that number necessary to secure entry at such gateways.

As an alternative, foreign governments might also be more amenable to a charter services agreement if there were imposed some sort of frequency or capacity limitation on charter operations as the Federal Aviation Act and the Policy Statement recognize.

Turning to the rules of the game problem, this has been the greatest impediment to any intergovernmental charter understanding thus far. The United States has one set of rules; each of the other countries has its own set of rules. To be sure, European governments have brought a certain harmony into their charter rules through ECAC's efforts -- in further recognition of the homogeneity of that market. The difficulty is twofold. The rules have constantly changed and expanded over the years and have constituted a more significant grant of authority than the basic licenses themselves. The second difficulty is the insistence by the United States that charter service arrangements be bilateral when the Europeans insist on a common approach or at least uniformity in rules.

To illustrate the changing nature of the rules, charter services were by definition originally confined to single entity or own-use charters and affinity charters. The respective definitions are by now well known to most of you. Then a new kind of charter was established -- an inclusive tour charter which is not a charter in the historic sense at all since the members of the group have no affinity.

As more and more people desired to take advantage of the lower fares of charter services, violations of the rules became rampant. Governments were unable to bring themselves to enforce such rules although the rules were and are enforceable. Instead they groped for a new kind of charter which would not have the enforcement problems and so-called discriminatory features of affinity charters and have come up with a travel group charter concept. This proposal is still in the developmental stage on both sides of the Atlantic.

In its attempts to reach formal charter service agreements, the United States has sought to overcome the diversity of rules by suggesting that the rules of the country of origin of the charter apply. Foreign governments have wisely recognized, however, that the rules of the game must be mutually agreed upon and have rejected the U.S. suggestion. They are currently seeking, through the ECAC/US/Canadian discussions, to arrive at a common travel group charter concept.

Now the second place where the promise ignores reality is in the wishful allegation that charter services hold down fare levels and expand markets, offer opportunities to exploit the inherent efficiency of planeload movements, and provide low-cost transportation of a sort fitted to the needs of a significant portion of the traveling public. It is of course true that charter services operated in full planeload lots can be priced lower than scheduled services operated at less than full plane lots. And they have indeed exerted a downward pressure on transatlantic fares, at least in the last five years, although the importance of that impact is somewhat overexaggerated.

To quote from a recent IATA study,

"The scheduled operators' awareness of the demand for low price travel is not recent but has extended throughout the years. In their endeavours to cater for this traffic they have maintained a constant review of fare levels, introduced new types of fares, amended and improved existing fare types.

"From an original position of one class of travel with one fare level a structure has been developed which provides a wide range of promotional fares. Highlights over the years were the introduction of -

- a new lower class of service - tourist class. (1952)
- a family fare (1955)

- a short limit validity Winter excursion fare (1956)
- a third class of service - economy class (1958) -
tourist class service was abandoned in 1960
- different fares for jet and propeller services (1960)
- group fares (1962)
- a progressive extension of the short limit validity
excursion fare beyond the Winter period until in
1966 it was available year round
- inclusive tour fares (1966)
- group inclusive tour fares (1967)
- contract bulk inclusive tour fares (1969)
- longer limit excursion fares (1970)
- lower level longer limit excursion fares; youth fares
(1972). "

International scheduled service fares are highly regulated. Charter service fares are hardly regulated at all. Until both classes of service are brought within the same price regulation mechanism, the passengers to be sure will benefit over the short term from low fares, but the operators will go broke.

Let's look at what is happening. The situation for the supplementals as a group is grim. From 1970 to 1971 seven of the thirteen supplemental

carriers' financial condition worsened. At the same time, the supplemental carrier industry moved from a \$240,000 net profit to a loss of \$3.9 million. In the first quarter of 1971 the supplementals lost approximately \$900,000. In the first quarter of 1972 they lost \$2.5 million. Their financial condition appears to be worsening in 1972; only three show a profit in the first quarter. One of the supplemental transatlantic operators has ceased operations this year. The European experience is similar.

As for scheduled carriers, transatlantic operations in 1971 were a loss for all but two -- TWA and El Al. One analyst has estimated the loss by IATA carriers on the North Atlantic at about \$300 million in 1971, and projects a \$400 million loss in 1972.

And, let's take a look for a minute at the alleged inherent efficiency of charter services in the context of the North Atlantic market. The market has always been known for its high seasonal peak in the summer months. Today, in fact, about one-half of the total market moves in the months of June, July, August and September. The continually lower fares and the more intense supplemental competition have only served to intensify that peaking. A second feature about that peaking is that the preponderant traffic movement is eastbound in June and July and westbound in August and September. For scheduled services, operations are nearly at 100 per cent loads eastbound in June and July and only 50 per cent westbound. In

August and September there are 100 per cent loads westbound and 50 per cent eastbound providing a maximum average load factor for the four months of about 75 per cent. Even with sharply reduced capacity in the shoulder and off-peak months, average loads over the entire year can never exceed more than 60 per cent. Obviously, over the long run, prices for North Atlantic travel must reflect that kind of optimum load.

Now, how are charter services any different? I submit that they are not all that different since it is the same market with the same peaking and the same directional flow problems. Consequently, large-scale charter operations will not have the benefit of back-to-back operations at full planeloads and thus a certain amount of ferry mileage has to be built into charter pricing. Charter services will also need substantial fleet sizes to accommodate peak summer season travel should that become the prevalent type of service. What happens with the aircraft in the off-season. Heretofore, the U.S. supplementals have had the luxury of substantial military charter business available to take up the slack. This military business is rapidly disappearing. Charter specialists will invariably be faced with low utilization which will add another cost item to be recovered in the price structure. Thus the economies of the two types of operation will move closer and closer together and so ultimately will their price structures.

Conclusion

(Landry)

In summary, the Policy Statement attempted by Executive fiat to equate the roles of supplemental and scheduled airlines in the so-called bulk air transportation business. Back in 1962 when Congress established the legislative authority for supplemental air carrier operations, Mr. Staggers who is now Chairman of the House Interstate and Foreign Commerce Committee stated: "The House is also convinced that the existing volume of charter business is adequate to support the supplemental air carrier industry and that the potential in this field is very promising, provided that the CAB adopts a realistic approach as to the number of carriers required by the public convenience and necessity." Unfortunately, the CAB did just the opposite. It certificated twelve carriers, some of which have since failed. It put six U.S. flag supplemental carriers across the Atlantic, thereby inviting reciprocal action by their foreign governmental counterparts and thus sowed the seed for the nearly disastrous economic situation for all participants in the market today. There is just not that much room in the inn.

We would suggest that charter specialists ought to be tailored in number as have U.S. scheduled operators, with perhaps one charter specialist in each ocean, perhaps a maximum of two in the thicker Atlantic market. Or, if full decertification is too harsh a remedy, limited rather than broad geographic licenses should be the rule.

As a parting shot, we would suggest that the government would be mistaken to preserve the artificial role of the charter specialists at any and all cost, for their main value is the alleged competitive spur in pricing. The need for a competitive spur is only a sometime thing. The introduction of new types of equipment and the very basic need to fill seats are a more continuing spur. Let's face it -- the public by and large doesn't give a hoot about charter services. The public wants low fare services with as much convenience and flexibility as it can obtain at such fares.

We sincerely believe that a group of full service carriers can meet the full spectrum of the demands for air transportation more efficiently than two or more groups. The best public service for all elements of the traveling public can be provided by full service carriers. They meet the emergency and short-term demand requirements. They provide appropriate discount fares on scheduled flights for individual travelers who are more flexible. They offer special fares on scheduled flights for groups not requiring full aircraft charters. And, they provide full airplane charters for qualified groups. That whole array of services is available regularly and dependably at every city on the system.

But let there be no mistake--if charter services are ordained as the sole vehicle for the mass market, we will devote our energies and resources in full measure to that service. The public and the economy which depend upon regularly scheduled service will be the losers.

A P P E N D I X - P A R T I C I P A N T S

William S. Aiken, Jr.
Director of Aerodynamics
& Vehicle Systems - Code RA
NASA HQ
Washington, D.C. 20546
tel: 202-755-2397

Johannes Augustinus - Speaker
Supervising Economic Analyst
Port of New York Authority
111 8th Street
New York, N.Y. 10011
tel: (212) 620-7750

Zine Badissy
Flight Transportation Lab.
Dept. of Aeronautics
& Astronautics
Room 33 - 412, MIT
Cambridge, Mass. 02139
tel: (617) 253-2424

Marvin R. Barber (Russ)
NASA Flight Research Center
P. O. Box 273
Edwards, Calif. 93523
tel: 805-258-3311

John Borger - Speaker
Vice President & Chief Eng.
Pan American World Airways
John F. Kennedy Airport
Pan Am Jet Center
Jamaica Plain, N.Y. 10130
tel: 212-632-5220

A. M. Andrews - Speaker
Director
Bureau of Operating Rights
Civil Aeronautics Board
1825 Connecticut Ave. N.W.
Washington, D. C. 20428
tel: (202) 382-7778

Raymond Ausrotas
Flight Transportation Lab.
Dept. of Aeronautics & Astronautics
Room 33 - 411, MIT
Cambridge, Mass. 02139
tel: (617) 253-7574

Charles Baker - Speaker
President
Harbridge House
11 Arlington Street
Boston, Mass. 02116
tel: 267-6410

Robert H. Binder - Speaker
Acting Asst. Secretary for Policy
& International Affairs
Office of the Secretary
400 7th Street, S. W.
Washington, D. C. 20590
tel: 202-426-4551

Melvin Brenner - Speaker
Vice President, Marketing Planning
Trans World Airlines
605 Third Avenue
New York, New York 10016
tel: (212) 557-3084

Allen Buchbinder - Speaker
Senior Financial Analyst
Port of New York Authority
111 8th Street
New York, New York 10011
tel: (212) 620-7750

Preston Carnes
American Airlines
633 Third Avenue
New York, N.Y. 10017
tel:

George Callas
Mail Stop 210-10
NASA Ames Research Center
Moffett Field, Calif. 94035
tel: 415-965- 5488

George W. Cherry
Deputy Associate Administrator
(programs)
CODE RD-P
NASA HQ
Washington, D. C. 20546
tel: (202) 437-4450

E. M. Cortwright
Director
NASA Langley Research Center
Hampton, Virginia 23365
tel:

Prof. Richard DeNeufville -
Speaker
Transportation Systems Div.
Dept. of Civil Engineering
MIT
Cambridge, Mass. 02139
tel: (617) 253-7970

Charles Butler - Speaker
Director, Bureau of International
Affairs
Civil Aeronautics Board
1825 Connecticut Avenue, N.W.
Washington, D. C. 20428
tel:

Dr. Yupo Chan
Peat, Marwick, Mitchell
Washington, D. C. 200036
tel: 202-223-9525

Prof. Paul W. Cherington - Speaker
Harvard Business School
Soldiers Field Road
Boston, Mass. 02163
tel: (617) 495-6330

Edward I. Colodny - Speaker
Executive Vice President
Legal Affairs & Marketing Services
Allegheny Airlines
National Airport
Washington, D. C. 20001
tel:

David A. Coutts - Speaker
Vice President
Charles River Associates, Inc.
16 Garden Street
Cambridge, Mass. 02138
tel: 617-491-4090

Bart DeWolf
Draper Laboratory
DL - 7
MIT
Cambridge, Mass. 02139
tel:

Prof. George Douglas - Speaker
Dept. of Economics
University of North Carolina
Chapel Hill, N. C.
tel:

John H. Enders
Chief
Flight Transportation Systems
CODE ROS
Office of Advanced Research
& Technology
NASA HQ Room 626
Washington, D. C. 20546
tel: 202-755-2366

Samuel Ewer Eastman
Director, Office of Policy
Review
TPI - 20
DOT, Room 10 - 304
Washington, D. C. 20591
tel: (202) 426-4331

Henry B. Faulkner - Speaker
Flight Transportation Lab.
Room 33 - 411
MIT
Cambridge, Mass. 02139
tel: (617) 253-7573

Dr. Aaron Gellman - Speaker
The Wharton School
University of Pennsylvania
Philadelphia, Pennsylvania
tel: (215) TU 4-2910

Louis Gilfix, TPI-14
U. S. Department of Trans.
400 7th Street, S.W.
Washington, D.C.
tel:

George Eads - Speaker
Department of Economics
George Washington University
Washington, D. C. 20006
tel: 202-676-6155 or 6150

Stephen Emery
Director
Economic Planning
American Airlines
633 Third Avenue
New York, New York 10017
tel: 212-867-1234, ext. 2718

Donald A. Farmer - Speaker
Anti-Trust Division
U. S. Dept. of Justice
Washington, D. C. 20530
tel: (202) 739-3278

Bruce Gebhardt - Speaker
Director of Market Planning
United Airlines Executive Offices
P. O. Box 66100
Chicago, Illinois 60666
tel:

Donald R. Geoffrion
Assistant Director, VS-3
Special Projects Office
Federal Aviation Administration
Washington, D. C. 20590
tel: 202-426-3220

John Gillick, Esq. - Speaker
Office of the General Counsel
TGC - 30
U.S. Dept. of Transportation
Room 10102
400 7th Street, S. W.
Washington, D. C. 20590
tel: 202-426-4731

Robert E. Gordon - Speaker
Vice President, Long-Range
Planning
American Airlines
633 Third Avenue
New York, New York 10017
tel: 212-867-1234, ext. 2626

Anthony P. Hays
Flight Transportation Lab.
Dept. of Aeronautics &
Astronautics
Room 33 - 411, MIT
Cambridge, Mass. 02139
tel: (617) 253-7575

H. B. Hubbard - Speaker
Director
Operations Research and Dev.
United Airlines Executive
Offices
P. O. Box 66100
Chicago, Illinois 60666
tel: 312-952-6531

Dr. George W. James - Speaker
Vice President
Air Transport Association
1000 Connecticut Avenue
Washington, D.C. 20036
tel: 202-296-5800

Edward W. Gomersall
Acting Director
Advanced Concepts & Missions Div.
CODE RX
NASA HQ
Washington, D. C. 20546
tel:

Thomas Gregory
Mail Code 227-2
NASA Ames Research Center
Moffett Field, Calif. 94305
tel: 415-965-5881 or 5883

H.S. Hopkins
Lockheed-Georgia Company
Marietta, Georgia 30060
tel: 404-424-6890

Peter V. Hwoschinsky
Assistant Manager
Flight Transportation Lab.
Dept. of Aeronautics & Astronautics
Room 33 - 411, MIT
Cambridge, Mass. 02139
tel: (617) 253-2038

Prof. William A. Jordan - Speaker
Faculty of Administrative Studies
York University
4700 Keele Street
Downsview 463
Ontario, Canada
tel: 416-635-2359

John W. Kersey - Speaker
Vice President
Cargo Sales and Services
Eastern Airlines - Building 16
Miami International Airport
Miami, Florida 33148
tel: (305) 873-2674

Prof. James Kneafsey - Speaker
Transportation Systems Div.
Dept. of Civil Engineering
MIT
Cambridge, Mass. 02139
tel: (617) 253-5325

Chosei Kuge - Speaker
Export-Import Bank of the U.S.
811 Vermont Avenue
Washington, D. C. 20571
tel:

Monte Lazarus - Speaker
Administrative Assistant to
the Chairman
Civil Aeronautics Board
Room 1010
1825 Connecticut Avenue
Washington, D. C. 20428
tel: (202) 382-8815

E. Gene Lyman
Acting Director
Aeronautical Life Sciences Div.
CODE RB
NASA HQ
Washington, D. C. 20546
tel: 202-755-2370

James MacKenzie - Speaker
Director of Airline Economics
McDonnell-Douglas Aircraft Co.
3855 Lakewood Blvd.
Long Beach, California 90801
tel: 714-593-5611

Henry Kleine
Systems Analyst
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California 91103
tel: 213-354-4888

M. J. Krasnican
CODE RX
NASA HQ
Washington, D. C. 20546
tel: 202-755-3227

James E. Landry - Speaker
General Counsel
Air Transport Assoc. of America
1000 Connecticut Avenue, N.W.
Washington, D. C. 20036
tel: 202-296-5800

D. J. Lloyd-Jones - Speaker
Executive Vice President-Finance
American Airlines
633 Third Avenue
New York, New York 10017
tel: 212-867-1234, ext. 2001

James A. McMahon - Speaker
International Civil Aviation
Organization
1080 University Street
Montreal 101, PQ, Canada
tel: 514-866-2551, ext. 444

Dal V. Maddalon
NASA Langley Research Center
Hampton, Virginia 23365
tel: 703-827-3838

Bernard Maggin
Dept. Dir. Joint. DOT/NASA
Noise Abatement Office
NASA HQ, # RF
Washington, D. C. 20546
tel: 202-755-2384

Alfred C. Mascy
National Aeronautics & Space
Council
Exc. Office of the President
Washington, D. C. 20502
tel: 202-395-3562

Richard Michelson - Speaker
Computer Systems
The Boeing Company
Box 3707
Renton, Washington 98124
tel: 206-236-5477

Charles Mundo
Transportation Systems Center
55 Broadway
Cambridge, Mass. 02142
tel: (617) 494-2511

Gabriel Phillips - speaker
Vice President, International
Air Transport Assoc. of America
1000 Connecticut Avenue, N.W.
Washington, D. C. 20036
tel: 202-296-5800

Robin K. Ransone - Speaker
Director
Aeronautical Operating Systems
Mail Code RO
NASA HQ
Washington, D. C. 20546
tel: (202) 867-1234

Henry S. Marcus
Research Associate
Dept. of Ocean Engineering
MIT
Cambridge, Mass. 02139
tel: 617-864-6900, ext. 5151

Daniel P. Maxfield, TPI-22
Office of the Secretary
U.S. Dept. of Transportation
400 7th Street, S. W.
Washington, D. C. 20590
tel:

James C. Miller, III - Speaker
Department of Economics
Texas A & M University
College Station, Texas 77843
tel:

Robert M. Pennock
Manager, Product Forecasting
Commercial Airplane Group
The Boeing Airplane Company
P. O. Box 3707 M/S 76-77
Seattle, Washington 98124
tel: 206-237-9262

William Raduchel - Speaker
Harvard University
Kirkland House G-23
Cambridge, Mass. 02138
tel:

John M. Riebe
LSAD
Mail Stop 262
NASA Langley Research Center
Hampton, Virginia 23365
tel: 703-827-2608

Dr. Leonard Roberts
Director of Aeronautics
& Flight Mechanics
NASA Ames Research Center
Moffett Field, Calif. 94035
tel: 415-965-5066

Wilson Rogers, Esq. - Speaker
Office of the Gen. Counsel
Massachusetts Port Authority
Boston, Massachusetts
tel:

Harvey Safeer
Operations Research Analyst
Office of Noise Abatement
U.S. Dept. of Trans. TST-53
400 7th Street, S.W.
Washington, D.C. 20590
tel: 202-426-9502

K. H. Schaeffer
Transportation Systems Center
55 Broadway
Cambridge, Mass. 02142
tel: (617) 494-2510

Robert Schlundt
Draper Laboratory, DL - 7
MIT
Cambridge, Mass. 02139
tel:

Prof. Robert W. Simpson-Speaker
Director
Flight Transportation Lab.
Dept. of Aeronautics &
Astronautics
Room 33-412, MIT
Cambridge, Mass. 02139
tel: (617) 253-3756

Michael J. Roberts
Booz-Allen
4733 Bethesda Avenue
Bethesda, Maryland
tel:

Dr. William R. Roy - Speaker
Staff Vice President
Advertising & Sales
Pan American World Airways
Pan Am Building
New York, New York 10017
tel: 212-973-2513

George N. Sarames - Speaker
Manager
Commercial Transport Research
Lockheed-California Company
Dept. 95-85, Bldg. 63
Burbank, Calif. 91503
tel: (213) 847-6761

Harry Schmidt
Post College L.I.
Long Island, New York
tel: 516-627-7007

Dr. Lewis M. Schneider - Speaker
Temple, Barker & Sloane Inc.
36 Washington Street
Wellesley, Mass. 02181
tel: 617-237-2980

Ann B. Smith
Flight Transportation Laboratory
Dept. of Aeronautics & Astronautics
Room 33-412, MIT
Cambridge, Mass. 02139
tel: (617) 253-7571

Cynthia L. Smith
NASA - Ames Research Center
Mail Stop 202-7
Moffett Field, Calif. 94035
tel: 415-965-5877

Al Stout - Speaker
Deputy Director
Bureau of Economics
Room 801
Civil Aeronautics Board
1825 Connecticut Avenue, N.W.
Washington, D. C. 20428
tel: (202) 382-7783

William M. Swan - Speaker
Flight Transportation Lab.
Dept. of Aeronautics &
Astronautics
Room 33 - 411, MIT
Cambridge, Mass. 02139
tel: (617) 253-7571

Prof. T. Nicolaus Tideman -
Speaker
Dept. of Economics
M14, Littauer Center
Harvard University
Cambridge, Mass. 02138
tel: (617) 495-2130

Richard J. Weber
Mission Analysis Branch
Mail Stop 86-1
NASA Lewis Research Center
2100 Brookpark Road
Cleveland, Ohio 44135
tel: (216) 433-4000, Ext. 273

Joseph Snodgrass - Speaker
Director
Transport Aircraft Council
Aerospace Industries Assoc.
of America
1725 De Sales Street, N. W.
Washington, D. C. 20036
tel:

Jack Stultz
Commercial Marketing
Silkorsky Aircraft
Stratford, Connecticut
tel: 203-378-6361, ext. 1104

Dr. Nawal Taneja - Speaker
Flight Transportation Lab.
Dept. of Aeronautics & Astronautics
Room 33 - 411 MIT
Cambridge, Mass. 02139
tel: (617) 253-7571

Dr. Joseph F. Vittek, Jr. - speaker
(Workshop Director)
Deputy Director
Flight Transportation Lab.
Dept. of Aeronautics & Astronautics
Room 33 - 411, MIT
Cambridge, Mass. 02139
tel: (617) 253-7572

Robert L. Weirich
Booz-Allen
4783 Bethesda Avenue
Bethesda, Maryland 20014
tel: 301-656-2200

John S. White
Mail Code 210-3
NASA Ames Research Center
Moffett Field, California 94035
tel:

Darrell Wilcox
Advanced Concepts & Mission Div.
Mail Code 202-7
NASA Ames Research Center
Moffett Field, Calif. 94035
tel: 415-965-5887

Prof. John Wiley - Speaker
Flight Transportation Laboratory
Dept. of Aeronautics & Astronautics
Room 33 - 412, MIT
Cambridge, Mass. 02139
tel: (617) 253-7454

Edward Wischmeyer
Draper Laboratory, DL - 7
MIT
Cambridge, Mass. 02139
tel: